THE METAL INDUSTRY
WITH WHICH ARE INCORPORATED
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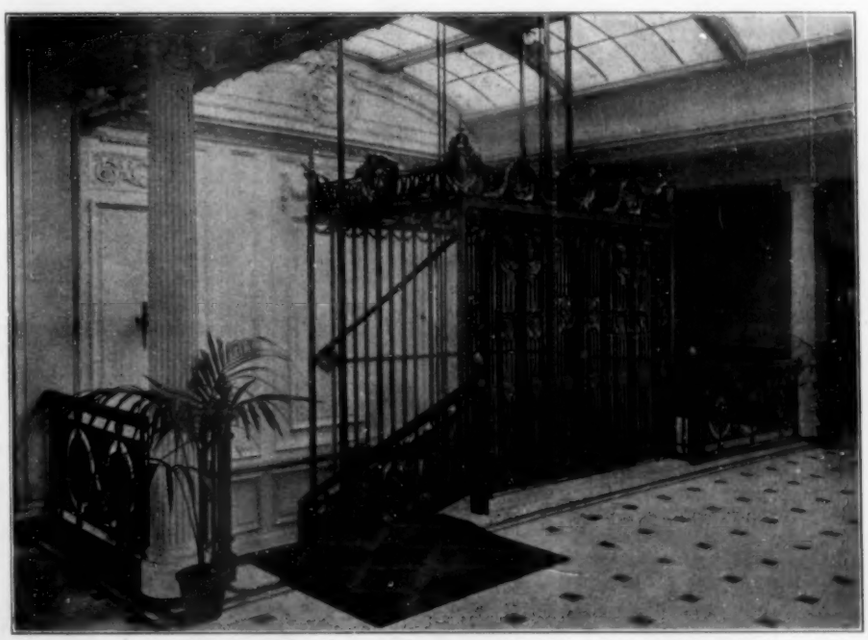
NEW SERIES
VOL. 5, No. 11.

ART METAL WORK ON THE "LUSITANIA."

(From Our British Correspondent.)

The maiden voyage of the "Lusitania" has stirred excitement on two continents, because, in respect of speed, modern equipment, gigantic size, and luxurious furnishing, it is conceded to represent the high-water mark of British achievement. Its metallic decorations are as superb as everything else connected with the ship, and it will be no surprise to metal artists in America to learn that in the equipment of this ship, Birmingham, the British home of the brass and art metal trades, has had its full share. But it is a little startling to find that in regard to elaborate metallic ornamentation one of the youngest of the local companies has carried off the highest honors.



ELEVATOR ENCLOSURE ON THE "LUSITANIA."

At Bromsgrove, situated about fourteen miles from the city, in the centre of one of the prettiest rural districts of Mid-England, is located the Bromsgrove Guild of Applied Arts. Its moving spirit is Walter Gilbert, and in view of the extreme youth of the concern the history of its achievement reads like a romance. The firm is exactly seven years old, and at its inception the staff consisted of a man and a boy. It now comprises about 150, covering such varying art departments as ceiling decoration, figure bronze work, electric fittings, and ornamental stained glass. Its artists are collected from the great centres of Europe, Paris in particular having furnished a strong contingent. The Guild pride themselves upon carrying through their work from start to finish, including the mixing of metals and the preparatory work of the foundry. A great feature is made of the introduction of living birds and animals, and in a wired enclosure fronting the window of the principal studio is a choice collection of livestock, including doves, pigeons, pheasants, squirrels, guinea pigs, etc.

The Guild has a remarkable record of achievements to its credit. To take only a few at haphazard. It has been entrusted with the provision of the great entrance gates at Buckingham Palace, and it has just completed the Canadian gates for the Victoria Memorial, one of the finest things ever done in metal work. It furnished the silver trowels, keys and caskets for the ceremonial use of His Majesty King Edward VII. at six separate stone layings, including the Royal College of Science, and the Royal Naval College, Dartmouth. Similar services have been rendered to the Prince of Wales and other eminent personages, while ornamental erections

are being carried through for a great number of British and foreign municipalities. Its reputation is already world-wide.

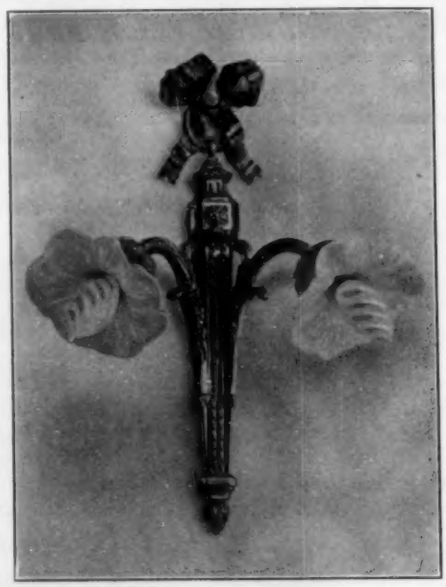
The firm have furnished metal and plaster work to the amount of no less than £10,000 on the "Lusitania," of which something like one-half was in respect of metallic decoration. We are able to furnish photographs, which give a very good idea of the character of the work done. The "Lusitania" has quite a specialty in steamer equipments, in the provision of a lift serving five floors, and the lift enclosure and staircase were entrusted to the Guild. The enclosure is the most expensive and the most elaborate of any entrusted to any firm in England. The metal is furnished with bronze enrichments on both sides, a feature being that the decoration is carried out just as elaborately on the inside as on the outside. Both the enclosure and staircase are executed in the most refined type of Louis XVI. art, and some of the best artists in Europe who shared in the production of the Buckingham Palace gates, Canadian gates, and the Australian screens of the Victoria Memorial worked upon this enclosure. The enclosure is lined with glass, and everything has been done to give the idea a completeness. It should be added that the supervising architect, James Miller, A. R. S. A., of Glasgow, gave instructions that the workmanship and design were to be the very best which Great Britain could produce. The firm claim that this instruction has been carried out as far as all the lift's predecessors are concerned. In other words, they have beaten all past records.

A higher pitch of magnificence has been reached in the metal work of the Louis XVI. sideboards in the dining room, which is a piece of very exceptional work, and is claimed to be as fine as anything produced in that line.

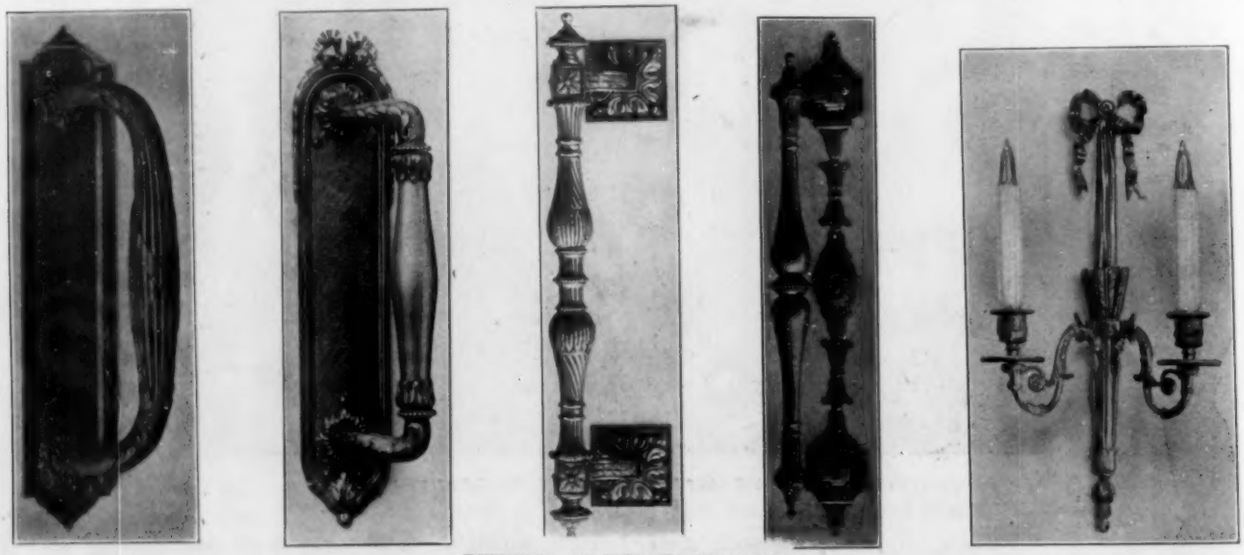
The photographs of the work done render description practically unnecessary. The electric fittings are of a simple but refined character, and the other decorations represent a combination of the Louis and Georgian periods.

As showing the comprehensive character of Bromsgrove art it may be mentioned that the firm produced the ceilings in the music room and smoking rooms and lounges, all Georgian in type, the writing room in the style known as "Adams," and in the deck entrances, corridors and stairways, all of Louis the XVI. type. The electric fittings represent in value about £3,000 throughout the ship.

Through the courtesy of John Brown & Co., Ltd., the builders of the "Lusitania," we are able to furnish a complete list of the British firms who supplied metal work for that magnificent vessel. Particulars have already been given of the high-class work supplied by



the Bromsgrove Guild of Applied Arts. The other firms were Shanks & Co., Ltd., Barrhead, near Glasgow; John Finley & Co., Ltd., Glasgow; Alexander Fisher, Kensington, London; William Kemp & Co., Glasgow; G. Trollope & Sons and Colls & Sons, Ltd., London; Waring & Gillow, Ltd., London; Wylie & Lochhead, Ltd., Glasgow; Marsh, Jones & Cribb, Ltd., Leeds; Wm. McGeoch & Co., Ltd., Glasgow, and J. W. Singer & Sons, Ltd., Frome, Somerset.



FITTINGS ON THE "LUSITANIA."

Some of these firms are unable for various reasons to supply details, but some useful particulars have been furnished by several of the above named. Most important contributions were made by William McGeoch & Co., Ltd., whose headquarters are at Glasgow, but who have a large factory in Warwick Works, Bir-

mingham. The firm supply on an enormously large scale electro-plated lamps and ship fittings. They supplied all the locks, door furniture, finger plates and ordinary state room fittings throughout the ship. In addition they furnished many beautifully chased crank door handles, and door furniture and finger plates representing different periods of design for the various public rooms, with some of the cabinet metal furnishing for some of the special state rooms.

Under the heading of electrical work the same firm contributed several thousand electric fittings and incandescent lamps with chased examples of delicate design representing various periods for four or five of the public rooms. A special feature was the series of illuminated sign lanterns for use in the corridors and decks pointing to the various places of public utility. Some of the best examples of their work were a number of beautiful bronze fittings with rich cut glass dishes for the lighting of the verandah cafe, which is a feature of the "Lusitania" and her sister ships.

were one of the original makers of lamp holders under license from Messrs. Edison & Swan. For some time before this they had been producing general brass goods, and ship's oil and candle lamps combined, with electrical attachments, as sufficient confidence had not then been placed in dynamos for ship lighting. The firm now make all classes of electrical goods, from large switchboards for power work to the smallest accessories. All along the firm have made a special feature of ship fittings, and have supplied within recent years fittings for most of the well-known liners and Atlantic greyhounds. The electro-plated and mercurial gilt fittings described and illustrated above are now a very important feature in the furnishing of all large vessels.

One of the daintiest little items in the ship's fittings was a piece of work by Alexander Fisher, of Kensington, London, consisting of a couple of overmantles in the music room. They were made in vitreous enamels upon copper and silver, and were richly framed in

SIDEBOARD ON THE "LUSITANIA."

One of the firm's specialties was a duplex patent ship's light indicator, an ingenious apparatus fixed in a brass case with a teak cover. It was fixed in the chart room with special controlling apparatus for Stone's system of watertight doors and appliances in connection with the working and navigating of the ship. The indicator is used for the purpose of showing when all the signal lights are burning properly. By the courtesy of Messrs. McGeoch we are able to add illustrations of their principal contributions.

The finish in the first-class public rooms was mercurial gilt, and in the second-class public rooms what is termed Ormolu Lacquer, which looks almost as well but is a little less expensive. The workmanship in both cases was the same.

A few words may be added with regard to this firm, which has had a great deal to do with the fitting up of ships since it was founded by the father of the present chairman in 1832. It commenced operations in Argyle street, Glasgow, but the Warwick Works, Birmingham, were acquired to meet the demand for electric equipment about a quarter of a century ago, and there

oxidized silver. The subjects of the enamels were "The Glory of the Sunrise" and "The Conquest of the Ocean." The color was such as can only be obtained by the glowing quality of enamels upon metal. The design of the first enamel consisted of two figures looking seaward at the sun rising over the waves tipped with the gorgeous reflection of the orb of day. The other was a symbolical figure moving over the dark green sea advancing triumphantly over the waves. They were the largest enamels of their kind ever executed in this country.

All the principal fireplaces were furnished by Wm. Kemp & Co., Glasgow, namely, the one in the writing room, in the Adams style, the one in the grand deckhouse entrance in the Louis XVI. style, and those in the first-class lounge and first-class smoke rooms in the Georgian styles. They are all very handsome and special things, they are specially designed for the ship, but unfortunately no photographs were kept of them.

British makers furnished all the equipments for the sister ship the "Mauretania," which is just now engaged in various trial speed trips.

ECONOMY IN MELTING.

By Jos. H. Hart.

In the metal industry, economy in melting covers such a wide scope in its various departments that it is difficult to cover the entire field at one time. This general principle is, in reality, the keystone of the entire industry, and determines, in the great majority of cases, the efficiency of the process and the difference between profit and loss in the ledger.

Economy in this field covers not only economy of fuel in its character and cost, but also economy in heat consumption in its utilization and in the elimination of waste at this point. Then comes economy in metal, due to the oxidizing effect of the heat, more or less present in melting, and apparent in the shrinkage. Then follows economy in machinery and devices for holding and operating the metal during melting, and finally the economy in heat after melting, in the utilization directly of the metal in the mold.

ECONOMY IN FUEL CONSUMPTION.

Economy in fuel consumption applies in two different directions, economy in the cost of fuel, due to the character of the same, and economy in quantity of fuel used. Almost every fuel, except wood, can be used with more or less efficiency in the melting of metal. The range in cost is extremely wide, varying from slack and coke to oil and gas, and the cost of this factor cannot be considered as a separate factor from the standpoint of B. T. U.'s produced per pound in the fuel during consumption. All other economies mentioned in the preceding paragraph must be considered in the determination of the weight of this factor, due to the inter-relation of all these other factors with their varying importance in a determination of a choice in this field. Production has shown almost conclusively that the most expensive fuels are more satisfactory in this department than the cheaper ones, except in the furnace for reducing dross and skimmings. For the castings where shrinkage due to oxidation plays an important part, the oil and gas burners are undoubtedly superior under present conditions, but for the reduction of drosses and skimmings the cheapest fuels are very satisfactory. This statement applies merely at present to the exact conditions in the trade, and the present possibility in regard to applications to devices used in melting. Undoubtedly a small gas producer, producing either fuel or water gas, will come into general use in this field, and permit the cheapest kinds of fuel to be utilized for the melting, with an efficiency comparable to that obtained by the utilization of the most expensive fuels in the market to-day.

Not only is there a possibility of direct utilization of producer and water gas in this field by any of the producers at present on the market, but a remarkable economy in design in this field is possible, due to the production of the gas in connection with its direct utilization in the gas melting furnace without intermediate devices and storage tanks.

Following this comes the possible economy in draft. Various devices are utilized for the production of an artificial draft and for the mixing, more or less complete, of the air with the fuel. The economy in coal and metal is closely allied to these devices, since the oxidizing and reducing effect of the flame is in direct proportion to the efficiency of mixing of the air and fuel. Devices for regulating and producing the air draft can be constructed in a large number of ways.

In this field, steam jets can be used together with an injector device for producing the flow of air, and compressed air can be used by the same method. Rivet forges are produced to-day which utilize compressed air with a high efficiency by using the compressed air to produce an air blast by utilizing the injector principle, or to operate a fan by impinging on its vanes. This has resulted in a remarkable economy in power in the production of the draft in this field and its application is equally possible in melting furnaces. Also compressed air of varying degrees of compression can be used directly in the production of draft, and can enter directly through a sprayer into the furnace, mixing thoroughly with the air. The advent of all these devices is possible, with a resultant economy in this field, and is dependent not only upon power consumption in the production of compressed air in the draft, but upon the relative efficiency of the process in producing a complete mixture and the elimination of the oxidizing effect of the heat on the metal.

ECONOMY IN HEAT CONSUMPTION.

After this comes the possible economy in heat consumption. This economy consists not only in an economy of actual heat consumption from the standpoint of B. T. U.'s utilized to the proportion of those lost, but also an economy of time and the rapidity of its utilization. This large factor operates in two ways in regard to economy. Rapidity of heat consumption results not only in an increased output for a given furnace, but also a diminution in the shrinkage of the metal, and also a diminution in radiation loss per pound of metal melted. However, rapidity of consumption of heat is dependent upon difference of temperature available in the conduction of the heat into the metal, and this sometimes operates to diminish the efficiency indirectly. Thus, rapid melting is often accomplished by an intenser heat, resulting in increased rapidity in the flow of heat into the metal. The higher the temperature in the furnace, the greater almost invariably becomes the depreciation effect, and equable arrangements between these two departments must always be considered in a determination of this factor. The processes involved in the best heat utilization have been used primarily in smelting furnaces where the heat from the products of combustion is utilized to the last available degree before expulsion.

DESIGN OF FURNACE.

The design of a furnace and its availability in regard to the consumption of heat and the utilization of residual heat, is a matter of prime importance in this field. The back draft is an example of a device which tends to increase the efficiency of heat consumption. The double furnace run in series is another example of increased efficiency of heat consumption, since the blast ordinarily wasted is used for preliminary heating in the second charge. Complete combustion is also a matter of prime importance in this regard, and this is dependent absolutely upon the air supply and the efficiency of mixing. If more than enough air is supplied to the furnace than is required for the oxidation of the fuel, there results a loss in two directions. The first is due to the oxidation of the metal, resulting from the excess of oxygen present in the mixture, and the blast is then known as an oxidizing flame. Further, this excess air must be heated up and this heat is lost in the exhaust. Further, the excess of air tends to diminish the intensity of the blast and cut down its temperature by occupying a larger volume. Hence, the charge must be heated longer and produced with a resultant increase in fuel consumption. On the other hand, if insufficient air is supplied to produce perfect combustion, a large portion of the fuel is unable to be burned. It goes out in the form of smoke and soot,

and represents just so much fuel wasted. The efficiency of the blast and the perfection of the mixture is a matter of prime importance in economy of heat production and utilization in this field. It goes without saying that this efficiency is related largely to the efficiency of the device used in the production of the blast and the formation of the mixture. As has been said, various devices have been used. It does not pay to use a device which fails to supply a sufficient amount of air for the blast, or one that limits its production in any way. Thus, efficiency of production in the air blast is of minor significance in comparison to the efficiency of its utilization. Thus, all devices in which the air supply may prove inadequate or unsatisfactory from a pressure point of view should not be considered.

EFFICIENCY OF HEAT UTILIZATION.

Now in regard to the efficiency of the heat utilization. An average of fifty heatings per crucible in the ordinary practice is not uncommon, but is not as general as it should be. The reason for crucible consumption in foundry work is due almost entirely to variation in temperature of the crucible. If the crucible is constructed of the proper material and not exposed to the air, there is no reason why intense heat should destroy it in such a small period of time. The trouble with the average crucible is due almost absolutely to the wide range of temperature to which it is subjected and to the deteriorating effect of the atmosphere. Another factor to be considered in the heating of crucibles is that of shock. Crucibles subjected to intense heat become extremely brittle and friable. The slight shock due to the dumping of the load into the crucible, or to the strains produced on its removal, is responsible for the great majority of breakages of crucibles in this field, after the wide variation of temperature has weakened the vessel. The result is, that users of crucibles should obtain extremely strong ones, and reduce to a minimum the deteriorating influences, and this has been accomplished to a certain extent in the tilting furnace. In the ordinary furnaces the crucible is removed and then subjected to the deteriorating influence of handling and the oxidizing and cooling effects of the atmosphere. A crucible at an intense heat removed suddenly into the cool atmosphere generally cools unevenly. Drafts and moisture present in the atmosphere produce uneven cooling and subject the crucible to a great strain, which generally limits its life, and hence the ordinary crucible it unsatisfactory under present conditions. The tilting furnace is so constructed that the melting crucible is not removed, and is not subjected to the atmosphere or shock of handling, and has a much longer life on that account. Care should be taken even in these devices to prevent shock in loading, and heat and removal of the material should be accomplished as gradually as is permissible with sufficiently rapid handling to produce satisfactory castings.

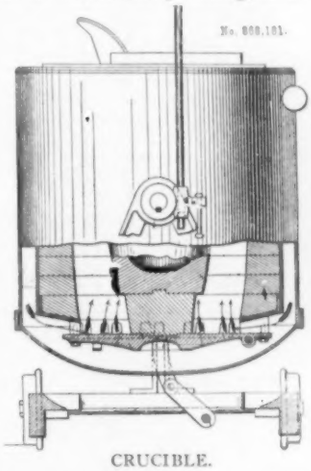
Again in the production of the castings or rather in the conveyance of the molten metal from the furnace to the mold, there is a distinct loss which does not seem necessary. This loss is a loss both in heating and apparatus. Carrying utensils have a fairly large depreciation factor, and the metal must be considerably superheated over the temperature required for the mold in order to allow for loss at this point. The removal of this factor would result in an economy of heat, machinery, labor and time.

The possibility of traveling cranes for the conveyance of the furnace direct to the mold is almost a probability, and is dependent at present upon the manufacturers of the machinery in this field.

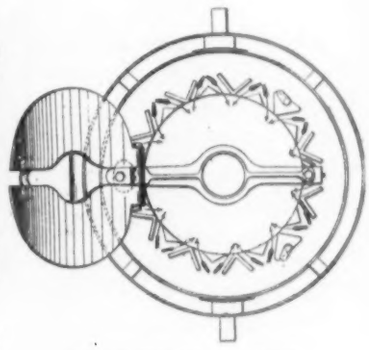
Sufficient has been said to show the importance of economy of heating in this field, and its great significance in the business, with the various economies possible and their complete interdependence for best business efficiency. That this inter-relation of the various factors is a complicated one goes without question, and it is unfortunate that there are not more technical men with a thorough and complete knowledge of physics and engineering operating in this department. Undoubtedly, the most successful manufacturers or operators in this field realize this condition fully, and have acted with the best judgment possible, but not always with adequate knowledge.

NEW PORTABLE CRUCIBLE FURNACE.

Letters patent granted October 15, 1907, to Matthew Harvey, of Walsall, Eng., describes a portable crucible furnace in which the furnace proper containing the crucible and fuel for heating it is arranged inside a cylindrical blast chamber, which is carried by side trunnions on a traveling frame. This arrangement permits the furnace to be tilted for pouring, and it can also be turned upside



CRUCIBLE.



INVERTED PLAN VIEW.

down for examination of the bottom part, which is made with blast inlets, through which the blast passes from the blast chamber to the fuel in the interior of the furnace proper round the crucible. The present invention is designed to facilitate the opening of the lower part of the furnace and blast passages, and cause the blast to be properly diffused in the fuel space round the crucible and prevent it from impinging on certain parts of the crucible and its support.

In the bottom of the annular plate, which is fixed to the bottom of the casing, is formed a series of blast grooves or passages, so shaped that the blast passes through them from the blast chamber in the direction indicated by the arrows. By this means the blast is divided into various currents, which impinge against one another as they meet in the annular blast space around the crucible, and they are thereby diffused and prevented from impinging directly on to the lower part of the crucible and the block on which it is mounted, which has previously had the effect of soon burning the block and crucible away. Fitting against the under side of these projections is a hinged bottom plate which formed the bottom of the furnace on which the coke rests. Provision is made for the convenient examination of the bottom plate.

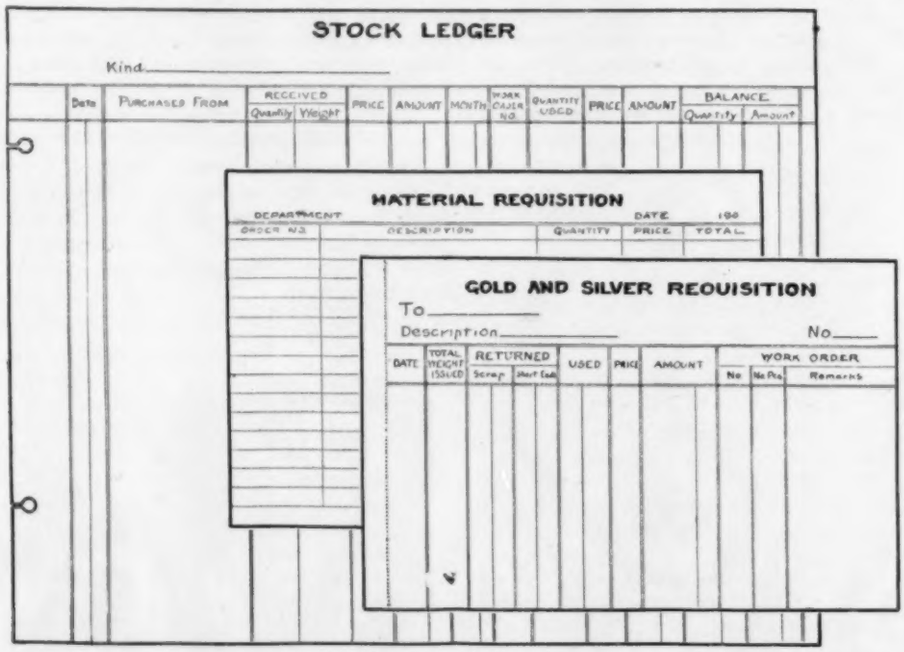
The shipments of gold from Cartagena, Colombia, to the United States during the fiscal year ended June 30, 1907, amounted to $980,227, as against $225,819 for the fiscal year 1906, or a gain of 300 per cent.

JEWELRY MANUFACTURING COSTS.

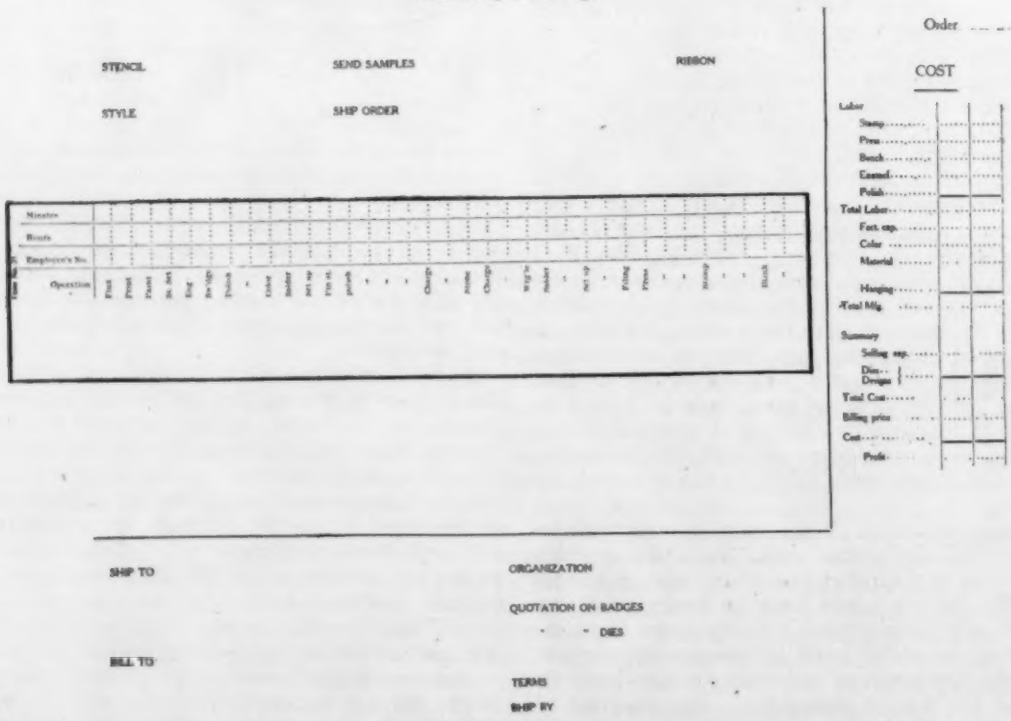
A COMPLETE DESCRIPTION OF AN UP-TO-DATE COST SYSTEM DESIGNED TO FIND ACCURATE COSTS OF PRODUCTION AND TO FURNISH A MONTHLY STATEMENT.

By D. C. Eggleston, M.E.

The fundamental principle in profitable factory management is that the articles sold must cancel all expenses incurred in manufacturing and selling the finished product besides leaving an ample margin for profit. Generally the cost system expert finds but little difficulty in devising a factory accounting system which will give the correct cost of production and selling expense incurred on account of various commodities. However, when he attempts to install a complete factory cost system in a jewelry manufacturing company he meets many obstacles not found in other industries. Yet in a plant manufacturing a highly specialized product where it is oftentimes difficult to place labor on a piece and premium work basis a cost system is of vital importance. The system herein described fur-



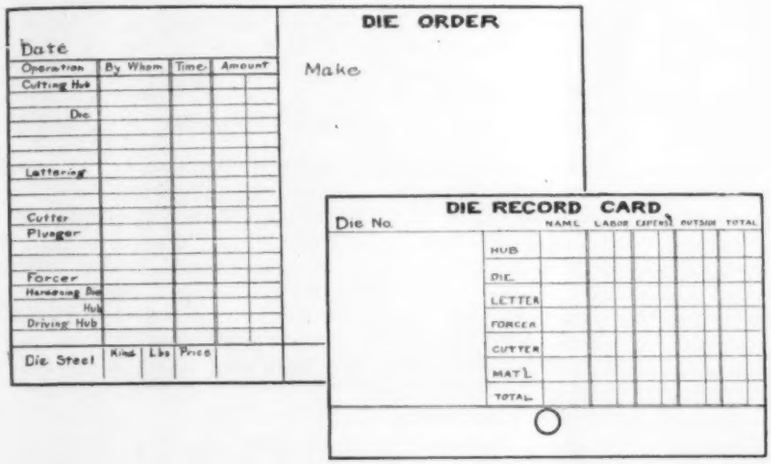
FORMS 1, 2 AND 3.



FORMS 4 AND 5.

nishes the cost of various orders and the profit on each as well as the profit on various classes of goods and the net profit each month. In addition to this a check is kept on materials and leaks are detected.

The organization is designed to distribute the responsibility among the heads of the selling, clerical, design stores, accounting, manufacturing and shipping departments. The output consists of badges, masonic emblems, college goods, athletic medals and souvenir novelties. The majority of the badges, emblems and medals require special designs, dies and tools. The use of a variety of enamels is carried to a considerable extent. Finishes of



FORMS 6 AND 7.

a high grade are much used which require a great deal of fine gold and which give a beautiful color to the completed product. Also special features are introduced, such as French enameled pictures, ornate engraving and ribbons. A wide range of metals is used, gold, silver, gilding, brass and white metals being required to satisfy the demands of an exacting trade. Taking the peculiarity of the product with its special features of design, color, enamel and metals it is apparent that a cost system must be carefully adapted to meet the requirements of local conditions.

The following controlling accounts are found in the general ledger under the head of Working and Trading Assets:

Gold and Silver.
Crude Materials and Trimmings.
Coloring Stock.
Manufactured Stock.
Samples.
Consigned Goods.
Blanks.
Supplies.
Product in Process.
Dies in Process.

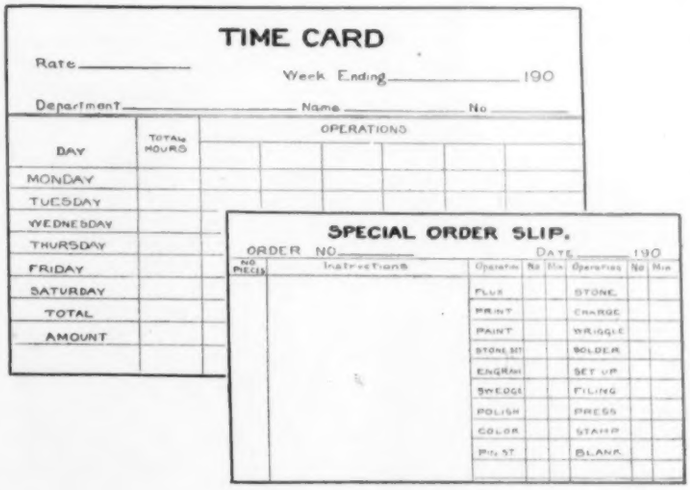
The pages of the subsidiary stock ledger, Form 1, are ruled for recording the details of all but the last two of the above accounts. The requisitions for material, Form 2, are the storekeeper's authorization for delivering all materials but gold and silver. For the precious metals a requisition differently ruled is used, as illustrated in Form 3. The scrap and short ends returned are deducted from the amount issued and the balance charged out by the storekeeper. The short end returned is the piece next issued and as the amount used is charged against production order numbers each time, this method furnishes a check on the stores issued.

All orders are booked as received and numbered consecutively, the separate items being designated by sub-numbers and entered on Form 4. In describing the order the quantity wanted, die number, color of enamel, material and finish are separately specified. The production order is designed for entering the time spent on each operation as illustrated. Nearly all material passes through the same series of operations, the only exception being that some orders do not call for enameling. The departments performing the various operations are shown in the accompanying diagram:

Department.	Operation.
Machine.	Blank.
	Stamp.
	Press.
Bench (1).	File.
	Set up.
	Solder.
Enamel.	Grind.
	Charge.
	Tile.
	Fire.
	Stone.
Polish.	Polish.
Bench (2).	Pin Stem.
	Paint.
	Stone Set.
Color.	Color.

Opposite each operation performed the operator places his clock number and the time spent on the operation.

A duplicate of the production order is made upon Form 5, which is designed to be filed for reference after the order has been shipped. In addition to the cost these sheets contain instructions for trimmings, shipping and billing.



FORMS 8 AND 9.

Orders for new dies and tools are issued on Form 6 to the die cutting and tool making departments. Against the proper operations the die cutters and tool makers charge their time. On the right side of the die order a space is provided for making a sketch of the die wanted. Each die is numbered when completed with the die order number, which number is always given when referring to a die. An impression is made in lead from each new die and a print taken, which is pasted on the die record card, Form 7. A cost summary is then added and the cards are filed for reference in a filing cabinet by die numbers.

Since many orders call for silver and the dies used

require similar shaped "blanks," these are kept in stock. Orders for these are issued on Form 9 and like other forms of orders these contain spaces for entering the time spent on each operation. In addition to the time spent, the number of pieces made and the weight of material used are entered on the order, which facilitates figuring the costs of production.

Daily each operator classifies his time on a time card, Form 8, which facilitates analyzing the productive pay roll. The non-productive division of the pay roll is classified as follows:

Office Salaries.
Packing and Shipping.
Foremen, Clerks and Janitor.
Designing.
Repairs to Dies.
Repairs to Cutters.
Repairs to Machinery.
Lost Time.
Tool Making.

The amount paid for each class of work divided by the time in minutes assessed against that division gives the current rate for labor. These rates are used in extending the time on production orders to find the labor cost. The summary of the charges for labor should equal the productive division of the pay roll for a corresponding period. The ratio of factory expense to productive labor is found each month and the proper percentages added to the productive labor charge to cover the indirect cost of manufacture. A table of estimates is used for figuring the cost of coloring. A list of materials and supplies used is next added, priced and extended, which gives the prime cost of material. The sum of the charges for labor, factory expense, color and material equals the manufacturing cost.

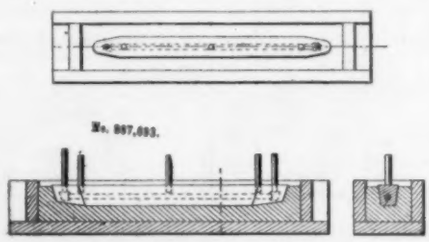
Selling expense is prorated on the basis of the manufacturing cost. In case a special die is made, this must be included in the cost summary. Depreciation is considered as a charge against income, which simplifies the work of the cost department. The sum of the manufacturing cost, selling expense, die and depreciation charges equals the total cost. The difference between this and the selling price is the net profit.

All costs are classified and a journal entry made of shop transfers. The costs are then filed for reference by classification and die numbers. Goods sent out on consignment are entered in a memorandum book and each month these are listed and priced up so that a journal entry can be made. Returned goods are checked off in the credit memorandum book and an adjusting entry made. Hubs, dies and cutters are charged to the proper account. Monthly an entry is made crediting reserve for depreciation and charging depreciation on machines and hubs, dies and cutters. A comparison of the current costs with billing prices is constantly made and the latter adjusted carefully so as to obtain the maximum revenue.

WIRE BAR MOLD CORE.

An invention for which letters patent were issued to Frank L. Antisell, of New York City, Octoer 8, 1907, relates to wire bar mold cores of the water cooled type. An object of the invention is to make a core which will produce a mold without cracks, into which water may lodge and cause an explosion when molten metal is poured. In the prior method of casting copper molds used for receiving molten copper and forming it into castings suitable for the rolling mill, the core of the desired shape is forced into the modern copper, displacing the copper and causing it to rise to nearly the extreme top of the core. As the mold cools, the core tends to expand and shrink, the tendency being for the core to be firmly shrunk in the mold, from which it is necessary to draw it by force, and for this purpose stud bolts are placed in the core. When such a core is finally forced from the mold numerous cracks are produced owing to the mold shrinking to a greater extent than the core has been compressed. To overcome this objection copper cores have been proposed, but such cores, while avoiding the disadvantage of cracking the mold, are open to the objection that each time a mold is cast, the compression results in a permanent set, and the core decreases in length each time a mold is made.

The core forming the subject of this invention may be made of any suitable metal, but cast iron is preferred. Extending longitudinally through the core is an extra heavy iron pipe, which has been thoroughly covered with graphite before the core has been cast around it, which permits the tube and the core surrounding it to freely



WIRE BAR MOLD CORE.

expand or contract relatively to each other. At each end of the core is a chamber into which the pipe projects. The entire core is fastened to a suitable apparatus by which a vertical movement may be obtained. One of the pipes is connected to a water supply and the other to an overflow.

In using the core the molten copper is poured into the open box, in the usual manner, to a predetermined height, and the core is lowered and forced into the molten metal. The metal rapidly chills and the core becomes hot and expands. At a critical point where cracking would begin to appear in the mold if the core is permitted to continue to increase in length and the mold to shorten, water is admitted to the pipe. The core shrinks to a greater extent than the mold, from which it may be freed with little or no effort by lifting up on the stud bolts. The mold will be found to be free from cracks. The core itself does not warp or twist out of shape and can be used over and over again.

At intervals during the past three years scientific men have been exploiting in the technical press a project which must be of great interest to the brass foundryman—the manufacture of non-ferrous alloys by electricity.

Since extremely small proportions of certain impurities in copper have a powerful effect in depressing the electrical conductivity, the conductivity bridge has been adopted as a quick and accurate means of testing the purity of refined copper.

Analytical chemistry detects injurious impurities in the commercial metals from which brass is made; it locates and measures the losses in the business; by pointing out the sources of inaccuracy, it standardizes the mixtures of a casting shop; it shows the exact composition of any metal submitted for reproduction; by selecting the good and bad qualities of molding sands it improves the quality of sand castings; it distinguishes good coal and coke from poor, and in many ways discovers the cause of trouble.

ALASKA COPPER.

By F. F. Burgin, Valdez, Alaska.

The copper business of southeastern Alaska—Ketchikan, Prince of Wales Island, Juneau, Treadwell, etc., shows increase each year and Alaska is now the ninth in production according to the government report. The copper belt extends from Mt. Urangell and the Copper river easterly for 100 miles; is there divided by rivers and passes into the coast and islands of the narrow strip of Alaskan territory to the south. The ores of the copper belt run as high as 70 per cent (copper glance) and as low as 10 per cent. On Prince William Sound are deposits of sulphide ores that promise well. At present the best known deposits are on Latouche Island and at Ellarnar. Latouche is staked from end to end. Ore returning $80 to the ton is shipped from Latouche. Ellarnar has been shipping low grade ore for two years, but pays 6 to 10 per cent on $1,000,000 capital. Knight's Island is in favor this year. The prospects are good for one or two mines there, such as the Hubbard-Elliott Mines Development Company's property.

"Inside," as we call it (120 to 130 miles from Valdez), are the Kotsina district, now being developed; the Hubbard-Elliott Mines Development Company's mine showing barnite and chalcopyrite with good ledges of copper glance; and the Bonanza, owned by the Guggenheims, which is all glance on one claim and has been developed enough to show $10,000,000 in ore in sight. The Hubbard-Elliott property is six miles or more in extent. Forty-three claims have been patented, and they have eighty or more opened up, in addition. In fact, they control the entire valley of Elliott Creek. I have just made a tour of 200 miles through the belt on horseback. The richness is phenomenal to all appearances, but work is needed to prove depth.

A railroad is being built from Catella on the coast to the Bonanza by the Morgan-Guggenheim interests. The Hubbard-Elliott Company is surveying a line from their property to the Chitina river to connect with the railroad to the Bonanza. At present supplies are taken in by the rivers on sleds in the winter; and by the Military Trail from Valdez in summer, on pack-horses. There is a great deal of barnite in the belt. The formation is limestone on greenstone, with barnite on the surface under the limestone, running into chalcopyrite with depth. The glance is an outcrop in some properties. There is some native copper in place, in certain districts.

PLATINUM IN COLOMBIA.

Consul I. A. Manning, writing from Cartagena, states that the platinum industry of Colombia seems to be attracting considerable attention from abroad and that recently a French company made some heavy purchases in the platina district and they are soon to send competent engineers to make a complete study of the region. The report says:

"Other capitalists and companies have also recently secured large holdings, which they expect to develop more scientifically than has been usual in working the mines. It is said that these companies will make an effort to find whether platina is found in quartz deposits as well as in placer ground, the latter being the only source of the present supply.

"The platina of Colombia has been found only on the headwaters of the Atrato River and the Rio San Juan in the State of Cauca and near the Pacific coast of Colombia. Most of these deposits are also gold bearing and they have been worked for a good many years, principally for the latter metal, as only during recent years has platina assumed a value sufficiently great as to give this metal an important place in the market. There is still no doubt a very great expanse of country rich in minerals of all kinds and where platina must exist, which has never yet been prospected in a scientific manner. While a great deal of the platina is exported through Cartagena and Barranquilla the export from Buenaventura must be considerable."

VANADIUM PRODUCTION.

According to a report of the U. S. Geological Survey the actual production of vanadium from its ores was begun in 1906 in Colorado, and a small output was made. A reduction plant was established by the Vanadium Alloys Company, at Newmire, and another plant, at which some vanadium concentrates were made, was put up on Dolores River. Vanadium is obtained as a by-product in the concentration of carnitite ores, about 20 per cent. of the concentrates being V_2O_5.

At Newmire roscoelite, occurring in a sandstone to which it gives a dull-green color, is roasted with salt, converting the vanadium to a chloride which is soluble in water. The roasted material is then leached and a ferric salt added, which precipitates the vanadium in the form of an iron vanadium compound. This is shipped to Niagara Falls and smelted, by electricity, to a ferrovanadium running about 25 to 27 per cent. vanadium and guaranted to contain not over 2 per cent. impurities. It sells for $5 per pound for the contained vanadium.

Another company is erecting a factory at Pittsburg, Pa., for the manufacture of ferrovanadium from ores imported from near Cerro de Pasco, Peru. The ore is a remarkable new sulphide of vanadium, called patronite, containing about 15 per cent. of vanadium. The deposits are said to be large.

No production of vanadinite or allied minerals is known to have been made during the year. These minerals generally occur as thin coatings along joint planes in rocks, and no extensive deposits are known to occur in the United States.

VANADIUM ORE ENTERS FREE.

The Board of General Appraisers, in sustaining the protest of Vincent J. Thompson, of New York, decided that vanadium ore is entitled to free entry as a crude mineral, instead of being dutiable as a metallic mineral substance in a crude state. The opinion of the General Appraiser says:

"We find that this ore is a mineral substance in which metals are not present in a metallic state. A chemical analysis of the mineral indicates the presence of traces of various metals and an appreciable percentage of vanadium. No metals are in this ore as metals or in a free state. They are in chemical combination with all the other elements which go to make up the mineral in question, and the evidence is to the effect that an elaborate chemical process is necessary to extract or isolate such metals. We are of the opinion that vanadium ore is not a metallic mineral substance within the ruling of this Board as to tungsten ore.

"The merchandise would thus appear to be entitled to free entry as claimed under paragraph 614 of the tariff, as a crude mineral, not advanced in value or condition by refining or grinding, or by any other process of manufacture, and we so hold."

In the electroplating industry the value of circulating the electrolyte, either by rotating an electrode or otherwise, has been recognized and the principle applied.

THE NEGLECTED AMMETER IN SILVER PLATING.

By C. S. Barbour, Jr.

To the average plater the use of the ammeter, in its broadest sense, appears too intricate for him to follow, as the text books, in dealing with this subject, convey the information in language beyond his comprehension, and while many writers have partly covered the subject, the reader is given the impression that it is necessary first to ascertain the number of square inches to be covered, then to do a lot of difficult figuring on each piece to be plated. Such, however, is not the case. After a series of experiments covering a number of years with silver solutions ranging from 1 oz. to 4 oz. of silver to the gallon, and from 5 oz. to 16 oz. free cyanide of potassium, the writer has found that the accompanying chart can be relied upon as being far more accurate than any method of weighing.

TABLE OF SILVER DEPOSITED PER AMPERE PER MINUTE.

*AMPERES.

Mins.	10	11	12	12½	13	14	15	16	17	18	19	20
1	½	½	½	½	½	¾	¾	¾	¾	¾	¾	¾
2	¾	¾	1	1	1	1	1¼	1¼	1¼	1½	1½	1½
3	1¼	1¼	1½	1½	1½	1¾	1¾	2	2	2¼	2¼	2½
4	1½	1¾	2¼	2	2	2¼	2½	2¾	2¾	3	3	3¼
5	2	2¼	2½	2½	2¾	2¾	3	3¼	3½	3¾	3¾	4
6	2½	2¾	3	3	3¼	3½	3¾	4	4¼	4½	4½	5
7	2¾	3	3½	3½	3¾	4	4½	4¾	5	5¼	5¼	5¾
8	3¼	3½	4	4	4¼	4½	5	5½	5¾	6	6	6¾
9	3¾	4	4½	4¾	4¾	5¼	5½	6	6½	6¾	6¾	7½
10	4¼	4½	5	5¼	5½	5¾	6¼	7¼	7	7½	7½	8½
11	4½	4¾	5½	5¾	5¾	6	6½	7¾	7¾	8¼	8¼	9¼
12	5	5¼	6	6¼	6½	7	7½	8	9	9	9	10
13	5½	5½	6½	6¾	7	7½	8¼	8¾	9¾	9¾	9¾	10¾
14	5¾	6	7	7¼	7½	8¼	8¾	9½	10½	10½	10½	11¾
15	6¼	6½	7½	7¾	8¼	8¾	9½	10	11¼	11¼	11¼	12½
16	4¾	6¾	8	8½	8¾	9½	10	10¾	12	12	12	13½
17	7	7½	8½	8¾	9¼	10	10¾	11½	12¾	13½	13½	14½
18	7½	7¾	9	9½	9¾	10½	11¼	12	13½	14	14¾	15
19	8	8¼	9½	10	10¼	11¼	12	12¾	14¼	14½	15½	16
20	8½	8¾	10	10½	10¾	11½	12½	13½	14¾	15½	16½	16¾
21	8¾	9	10½	11	11½	12½	13¼	14	15½	16½	17	17¾
22	9	9¼	11	11½	12	12¾	13¾	15¼	16¼	17	18	18½
23	9½	9¾	11½	12	12½	13½	14½	16	17	17¾	18¼	19½
24	10	10¼	12	12½	13	14	15	16¾	17¾	18½	19½	20¼
25	10¼	10¾	12½	13	13¾	14¾	15¾	17½	18½	19½	20½	21
26	10½	11	13	13¾	14¼	15¼	16¼	18	19¼	20	21	21¾
27	11¼	11½	13½	14¼	14¾	15¾	17	18¾	19¾	20¾	22	22¾
28	11¾	12	14	14¾	15¼	16	17½	19½	20¾	21½	22¾	23½
29	12¼	12½	14½	15	15¾	17	18¼	20	21½	22½	23½	24½
30	12¾	12¾	15	15¾	16½	17½	18¾	20¾	22	23	24½	25½
31	13	13¼	15½	16¼	17	18¼	19½	21½	22¾	23¾	25	26
32	13¼	13½	16	16¾	17½	18¾	20	22¾	23½	24½	26	27
33	13¾	14	16½	17¼	18	19½	20¾	23½	24¼	25½	26¾	27¾
34	14¼	14½	17	17¾	18½	20	21¼	24	25	26	27½	28½
35	14½	14¾	17½	18¼	19	20½	21¾	24¾	25¾	26¾	28½	29½
36	15	15¼	18	18¾	19½	21½	22½	25	26½	27¾	29	30
37	15½	15¾	18¾	19½	20	21¾	23¼	26	27	28½	30	31
38	16	16	19	20¼	20½	22½	23¾	26¾	27¾	29	30¾	32
39	16½	16½	19¾	20½	21¼	23	24½	27½	28½	29¾	31½	32¾
40	16¾	17	20	21	21¾	23½	25	28	29	30¾	32½	33¾
41	17	17½	20¾	21½	22	24	25	28½	30	31½	33	34
42	17¾	17¾	21	22	23	24½	26	29	30¾	32	34	35
43	18	18¼	21¾	22½	23½	25	26½	30	31½	33	34½	36
44	18½	18¾	22¼	23	24	25½	27	30½	32	33¾	35	37¼
45	18¾	19	22¾	23½	24½	26	28	32	32¾	34½	36	37¾
46	19	19½	23¼	24	25	27	28½	32¾	33½	35	37	38
47	19¾	20	23¾	24½	25½	27½	29	33	34	36	38¼	39
48	20	20½	24¼	25	26	28	30	34	35	36¾	38¾	40
49	20½	20¾	24¾	25½	26½	28½	30½	34½	35¾	37½	39	41
50	21½	21¼	25¼	26	27	29	31	35	36½	38	40	42
51	21¾	21¾	25¾	26½	27½	30	31¼	36	37	39	41	43
52	22	22	26¼	27	28	30½	32½	36½	37¾	39¾	42¼	44
53	22½	22½	26¾	27½	29	31	33	37	38½	40½	43¾	45
54	23	23¾	27¼	28½	29½	31½	33½	38	39	41½	44	46
56	23½	23½	27¾	29	30	32	34	38¾	40	42	45	47
57	24	23¾	28¼	29½	30½	33	35	39	41	42¾	46	48¼
58	24½	24¾	28¾	30	31	33½	35½	40	42	43½	47	48¾
59	24¾	25	29¾	30½	32	34	36	41	42¼	44	48	49
60	25¼	25½	30	31½	32½	35	37	41¾	43	45¾	49	50

The figures quoted above are within one-quarter of a pennyweight. In the original chart they were figured to the seventh decimal point.

In general practice, where the plater relies upon a voltmeter, the method is as follows: After striking he places the batch in solution running at, we will say, the second point of his switch; if his batch consists, say, of six coffee pots, each pot to receive 4 dwt. of silver, he may find that it takes forty-five minutes to get the necessary 24 dwt. This would, in reality, call for a current of 12½* amperes. If the dynamo is giving 5 volts, the resistance in his line, switch (up to the point in use) and solution consists of two-fifths of an ohm. Now, if later he finds it necessary to add cyanide of potassium to his solution, he unconsciously reduces the resistance to, say, one-fourth of an ohm, the voltage remaining the same. As 1 volt will carry 1 ampere through 1 ohm of resistance, 5 volts will carry 20 amperes through one-fourth ohm, hence he is now getting 20 amperes in place of 12½ at the same point of switch, and will be depositing 37.968 dwt. in place of 24 dwt. Of course, this calls for a large quantity of cyanide of potassium, but will serve to illustrate the point the writer aims at.

Later let us assume that the amount of free cyanide becomes reduced below the original point until the resistance has increased to one-half ohm, which, with the same 5 volts pressure, will now give us 10 amperes, which in turn will deposit between 18 (18.981) and 19 dwt. in the 45 minutes, thus the same batch, running the same time owing to natural changes in the solution, shows a difference in quantity of silver deposited, a variation of 100%. While admitting that a careful plater should not allow so great a variation to exist in his weights, yet the writer, after weighing and stripping, then reweighing work made by several of the most prominent hollow ware manufacturers in the country, has found a variation nearly as great as the example given.

It is owing to the difference of resistance in solution chargeable to changes in temperature, speed of dynamo, as well as to the necessary changes of amount of free cyanide, that the difference in weight of deposit is due. This variation, however, can be entirely overcome, no matter what the cause, by the intelligent use of the ammeter.

Where there is but one grade of plate called for, it is a good idea to use one of your best known pieces of work as a weight maker or sample. Having decided on the piece, which, for example, we will call No. 100 coffee pot, the weight agreed on being, say, 4 dwt., all other pieces to take a corresponding weight according to size, the vat, we will say, being of such size as to take six pots to make an average batch, as six pots × 4 dwt. = 24 dwt. Twenty-four dwt. will now be your standard, the teas being smaller, and we will be able to get in, well, seven to the batch; dividing the 24 dwt. by 7 would give you 3 3-7 dwt. as weight for the teas. The sugars, being still smaller, would require, say, 12 to make a batch—24 ÷ 12 would give you 2 dwt. as the weight of your sugars. The creams, being smaller yet, might run 16 to the batch, the standard 24, being divided by 16, now gives you 1½ dwt. as the weight for the creams. Now, the plater gets a batch consisting of two coffees, two teas, two creams and two sugars. According to predetermined weights would show as follows:

2	No. 100	coffee @ 4	dwt.	= 8
2	" "	tea @ 3 3-7	"	= 6 6-7
2	" "	sugar @ 2	"	= 4
2	" "	cream @ 1 ½	"	= 3
				21 6-7 dwt.

Assuming that the plater gets the best results at 12½ amperes, he sets his switch until the needle of the ammeter shows at that point, running his eye down the column of the accompanying chart headed 12½ (in this case, being marked by a star) until he comes to the weight nearest to what he wants (in this case being 21½ dwt.), now, following a horizontal line toward the left, he finds, in the first column, the number 41 minutes, which is the time required to deposit 21½ dwt. at 12½ amperes.

In picking out a batch care should be taken to select pieces whose combined weight will come as near as possible to the standard selected, remembering that the time itself does not determine the weight of deposit, unless the amperage is taken into consideration, as a batch running twenty minutes at 12½ amperes will receive exactly the same amount of silver as one running ten minutes at 25 amperes, although, all things being equal, the higher the amperage, the harder the deposit.

In a later paper, the writer will explain a method of handling a silver solution, enabling the plater to run with very high amperage without the danger of burning or getting a hard deposit, thus doing in one vat the work which would otherwise require three or four.

PROCESS FOR IMPROVING ALUMINUM ALLOYS BY HEATING AND CHILLING.

A patent granted to Ferdinand Gustav Alfred Wilm, of Drewitz, Germany, October 15, 1907, covers a process for improving the physical properties of aluminum copper alloys, or other alloys, by first heating to a certain temperature and then rapidly cooling. The method is claimed to add to the strength and to increase the elongation very considerably. The results are similar to those produced in steel by heating and then cooling. The inventor has determined the recalescence points for aluminum alloyed with certain percentages of copper. The alloy is heated to this point—of course, according to the mixture—but not in excess of this temperature, although it may be less by not more than 30 degrees centigrade. The heated metal is then cooled by quenching in water which may be at normal temperature.

Instances are presented showing the effect of this method. In the case of chilled castings of an alloy containing 4 per cent. copper the tensile strength has been increased from 15.5 to 22.9 kg. per square mm. and the elongation approximately from 5 to 7 per cent. Almost the same increase of tensile strength has been found in the examination of sand castings made with the same aluminum-copper alloy. Like results have been obtained after the alloy has been rolled.

The following table gives the recalescence points for various copper-aluminum alloys:

Percentage of copper:		Recalescence temperature:		
	1.	"	485°	centigrade.
"	2.	"	501	"
"	3.	"	512	"
"	4.	"	524	"
"	6.	"	530	"
"	10.	"	535	"
"	15.	"	538	"
"	33.	"	540	"

The process may be interposed between the several operations or steps, as in rolling or in drawing; it is claimed to be also applicable to other alloys.

At the present relative cost of the two metals, aluminum is from 10 to 15 per cent. cheaper than copper of the same electrical resistance. The weight of a certain length of aluminum wire is only 47 per cent. of a copper wire of the same length and resistance.

THE CARE AND CLEANING OF SILVER GILT PLATE.

By L. E. Taylor.

Some interesting directions for the care and cleaning of silver gilt plate are preserved with the church plate of Stinsford in Dorsetshire, England. These directions are dated June, 1737, and are headed

"Directions to keep the Silver Plate clean from the Silversmith who made it."

The silversmith in this instance was none other than Paul Lamarie himself.

The directions run as follows: "Clean it now and then with only warm water and soap and with a sponge, and then wash it with clean water, and dry it very well with a soft linnen cloth and keep it in a dry place, for the damp will spoyle it."

Compare with this extract the instructions given by the silversmith who made the plate for Carlisle Cathedral in 1679, for they are equally good.

"Be careful," he says, "to wipe it with a clean, soft linnen cloth, and if there chance to be any staines or spotts that will not easily come off with a little water, the cloath being dipp'd therein, and so rubb the flagons and chalices from the topp to the bottome, not crosswise, but the bason and patens are to be rubb'd roundwise not acrosse, and by noe means use either chalke, sand or salt."

These last words cannot be too strongly emphasized. It is sad to see how much damage has been done by excessive rubbing and the use of injurious cleaning materials. The simple directions given by Paul Lamarie and his brother goldsmith are still as good a guide as one can wish for, and those who value their old silver and silver-gilt plate would do well to follow them. Much harm can be done to beautiful silver plate through ignorance in cleaning it. A well-known English gentleman who possessed a pair of very beautiful old silver candlesticks valued them for their magnificent bronzy shade of coloring until one ill-fated day there came a British servant girl, armed with whitening in its roughest state, who cleaned them, scratched them and finally spoilt all their beauty. This incident is only one of a great many similar cases.

PRODUCTION OF GRAPHITE IN 1906.

The total value of the graphite produced in the United States in 1906 was $340,239, an increase of $22,028 over that of the previous year, but with a considerable decrease in quantity. The production of crystalline graphite in the States of Pennsylvania and New York in 1906 was 5,887,982 pounds, with a reported value of $238,064. This brings the average price per pound slightly above 4 cents, the range of reported values being less than 3½ and over 7 cents.

The report of G. O. Smith to the Geological Survey also states that the production of artificial graphite has steadily increased since its introduction in 1897. The quantity manufactured in 1906 amounted to 5,074,757 pounds, valued at $337,204, which is the largest quantity produced in any year since its first placing on the market. Of the total output 2,766,000 pounds were ground to a fine powder, and this product was valued at $94,578.

Manufacturers using less than 50 gallons of completely denatured alcohol per month are not required to secure a permit. Those using more than that amount per month must secure a permit from the collector of internal revenue of the district in which the business is located.

UNITED STATES GOLD PRODUCTION.

Former Directer of the Mint George E. Roberts has completed the compilation of the statistics of the production of gold and silver in the United States for the year 1906. He estimates the production of gold for that period to have been $94,373,800 as against $88,180,700 for the calendar year 1905, a gain in 1906 of $6,193,100. The principal gain was in Alaska, which amounted to $6,439,500. Nevada's gain in gold was $3,919,500; Oregon, $75,200; Tennessee, $22,300; Arizona, $55,800; Virginia, $5,300.

The greatest loss of gold in any State was in Colorado, where there was a decrease of $2,766,700. The next largest loss was in Montana, $367,300. California lost $364,200; South Dakota, $309,000; Washington, $267,000; Idaho, $39,900; North Carolina, $33,900; South Carolina, $20,500; Georgia, $71,100, and Wyoming, $18,000.

The total production of silver during the same period was 56,517,900 fine ounces of the commercial value of $38,256,400, as against 56,101,600 fine ounces valued at $34,221,976 in 1905.

The greatest loss in the production of silver during the year was in Montana, amounting to 914,400 ounces, and in Colorado of 495,400 ounces.

The average price of silver for the calendar year 1905 was 0.61027 per ounce, as against 0.67531 for the calendar year 1906.

JAPANESE ANTIMONY TRADE.

In regard to the production of antimony in Japan the American Consul-General at Yokohama states that it centers around Osaka and Kobe, but is a declining business. The largest production in recent years was in 1896, about 1,300 tons, valued at $115,000. The amount diminished annually until 1905, when it was less than 300 tons, valued at $45,000. Antimony is produced in China, and in recent years ores have been imported chiefly from that country, refined in Japan, and re-exported. In 1906 the imports were valued at $57,680 and the exports at $102,680.

NEW SOURCE OF ALUMINUM IN INDIA.

It has recently been claimed that a new source of aluminum might be obtained from India, where thousands of square miles of surface are covered with a deposit of laterite, varying from a few feet to hundreds of feet in thickness. The laterites are closely analagous to bauxite, the aluminum being present in the hydrated form. The high level laterites particularly are claimed to bear a striking semblance to bauxite, while the low level laterites contain much free silica and clay. The pureness of the deposits, their ready accessibility, their widespread occurrence and their association with flowing water are all points in favor of their being worked, should the demand for aluminum in India justify such a course.

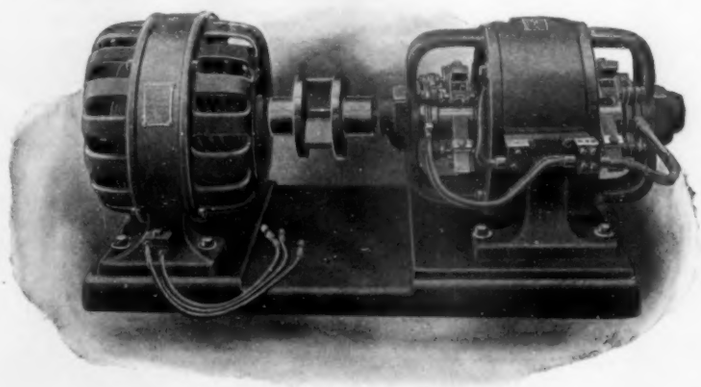
The American Consul at Trebizond writes that Asia Minor is rich in mineral deposits which have been developed but little. Copper, iron, coal, petroleum, silver, zinc and other minerals have been found, but owing to lack of capital and poor transportation facilities little mining work has been done. The new mining law is a great improvement over former regulations.

INDUSTRIAL

NEW AND USEFUL DEVICES, MACHINERY AND SUPPLIES OF INTEREST TO THE NON-FERROUS METAL INDUSTRY.

THE NEW HANSON & VAN WINKLE MOTOR-GENERATOR SET.

The Hanson & Van Winkle Company, of Newark, N. J., have designed a new line of motor-generator sets of from 100 to 500 ampere capacity. This company has, for a number of years, built large sets of 1,500 to 4,000 amperes, but the demand for motor generators of moderate capacity has been so insistent that the manufacturers have designed this particular line. As will be seen from the accompanying engraving, both the generator and



HANSON & VAN WINKLE MOTOR-GENERATOR SET.

motor are mounted on the same bed plate connected by a flexible coupling, thereby making a self-contained machine in every respect. These motors are furnished in any voltage to suit the conditions of installation.

The generator is designed for the three-wire system of current distribution, whereby two voltages can be taken from the generator at the same time.

A compact arrangement of this character is the most efficient since the loss due to heavy shafting is avoided, and the operating expense stops with the motor. Again, with the direct connected outfit the full capacity of the generator is always at the command of the operator, without reference to any other work. There is no loss in transmission as is the case when belts are used, so the full capacity of the generator is available for the plating bath. In many instances the plating dynamo is located some distance from the tank, and conductors of large cross section must be used in order that there may be no drop in voltage at the tanks; this, of course, increases the cost of installation. But with the motor-generator set wires from the power circuit can be brought to the plating room and the outfit set up near the tanks.

An outfit of this kind is an ideal one for the plating room, being a compact machine combining the power feature with a generator. These outfits are made in all sizes, using generators of both the bipolar or multipolar type.

According to the report of the American consul at Yokohama, the total shipments of copper from Japan last year amounted to 75,481,152 pounds, valued at $12,502,000. The shipments in 1904 were valued at $6,453,000 and in 1905 $8,034,000.

OVENS FOR DRYING SMALL CORES.

It is very important to have in a foundry an oven that will dry cores at short notice and without burning them. There are shops that have nothing but large ovens for drying small cores; this is all well enough as long as they have cores with which to fill the oven, but to fire up a large core oven to dry a few cores, which is very often done, is a very expensive and slow process. A great many foundrymen seem to think that all that is required is to have a fire place and to pile cores in, when, with a little more thought and slightly increased expense, they could obtain an oven built especially for the purpose of drying small cores, and one that will do it in a way satisfactory and economical.

With this idea in view the Obermayer Company, of Cincinnati, O., have placed on the market a small portable oven for just such cases. It is specially designed for use in small foundries where it is not deemed advisable to go to the expense of putting in a large oven. There are several advantages to be had in using this

OVEN FOR DRYING SMALL CORES.

"Cadet" portable core oven in that it can easily be moved from place to place and will answer the purposes for which it is intended. In every respect this small oven is the same as the larger sizes, but it has only three shelves, two being 23½ inches deep by 4½ inches high, and one 23½ inches deep and 9½ inches high. The dimensions are as follows: Height (with legs), 44 inches; height (without legs), 36½ inches; width, 29½ inches; depth, 32⅞ inches.

During last July the Straits Settlement exported 4,980 long tons of tin. Of this amount 713 tons went to the United States, 3,558 tons to England and 709 tons to the Continent of Europe.

DOUBLE HEAD MULTIPLE SPINDLE AUTOMATIC TURRET MACHINES.

The turret machines built by Geo. G. Prentice & Company, of New Haven, Conn., for whom Manning, Maxwell & Moore, of New York, are the selling agents, are designed for boring, facing, drilling, turning, threading and other operations on both ends of a piece at one setting in the chuck. The standard machine has three spindles in each head between which is a chuck having four sections or sets of jaws. The spindles carrying the tools are in line with the different sections of the chuck, except the upper section, where the operator removes finished work and inserts an unfinished piece, while the machine operates constantly on a piece of work in each of the other sections of the chuck. These machines have the same chuck steady bracket feature as the single head machines. This bracket automatically slides under the chuck and prevents any torsional strain while the tools are cutting. Before the chuck indexes it draws back out of the way.

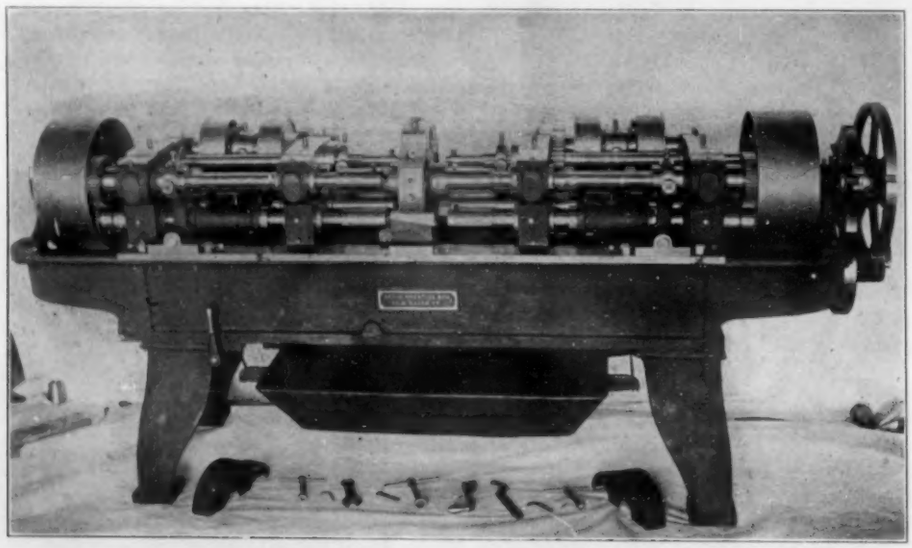
The spindles revolve and are fed up to the work by means of yoke and lever connections with cams on drums inside of the bed on cam shaft extending the entire length of machine. The forward-feed cams are set at the proper angle to give the required advance or cutting feed to the tools onto the work, and the reverse cams draw the tools back from the work when the operations are completed. While the tools are backing off from the work the chuck is automatically indexing around so that each piece of work is brought in line with the spindles which perform the next succeeding operations.

The whole operation of the machine is automatic and is timed so that the indexing occurs as soon as the longest single operation on any piece of work is completed. All the shorter operations are completed within this time, hence the time of finishing a piece of work on both ends is the elapsed time of the longest single operation plus a few seconds taken by the chuck in indexing and advancing of the tools. These machines are finishing work in less than half the time required by turret, chucking and hand screw machines.

As the chuck indexes towards the front of machines, the first or roughing spindles are at the front, and the finishing and threading spindles follow. The threading mechanism consists of sliding tap or die holder with fork lever connecting with cam on drum to start the lead of thread. The driving mechanism consists of forward and reverse friction pulleys with expanding rings. The tap is driven the required number of turns into the work, then the reverse is automatically engaged and the tap withdrawn.

The proper cutting feed for different kinds of metal is obtained by change gears, worm and worm gear connecting with main feed shaft on which all cam drums are placed. The spindles are back geared and have ample driving power for all work within the rated capacity of the machine. Attention is called to the fact that the first and second spindles in each head, which take the heavy cuts, are yoked together and are fed up to the work by means of a tool steel roll on under side of yoke bearing against the cam on feed drum directly underneath the roll. This makes a very rigid and powerful drive and there is no leverage or lost motion.

The three sizes of six-spindle machines are known as No. 52, for light work; No. 53, for ¾ in. pipe size threads and smaller, and No. 54, for 2 inches down to ¾ inch pipe threads. Net weight of machine with countershaft: No. 52, 2,300 lbs.; No. 53, 4,400 lbs.; No. 54, 7,500 lbs.



THE PRENTICE TURRET MACHINE.

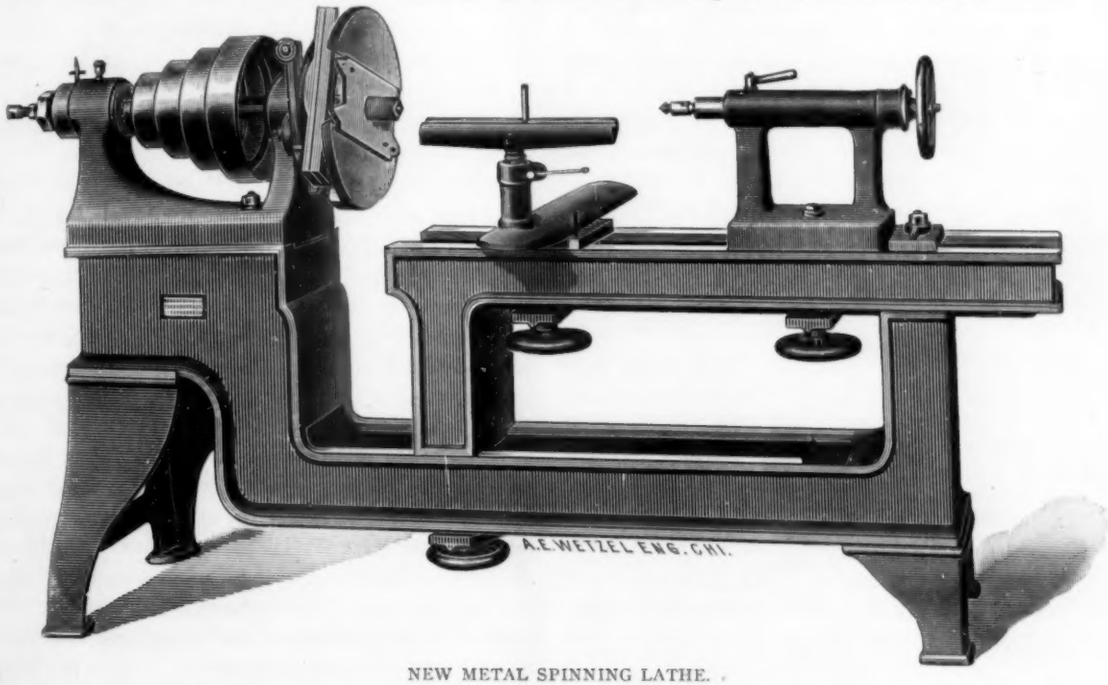
The company also make the same design of machine with four spindles in each head and five-section chuck. These are known as Nos. 42, 43 and 44, and correspond in threading capacity and weight to the Nos. 52, 53 and 54 respectively. This style of machine is better adapted for the bicycle hub and gas and electric fixture work where more than three spindles are required to give the desired finish.

"BASSITE."

"Bassite" is placed on the market by the Bassite Mining & Smelting Company, of Cincinnati, O., as a substitute for tin in casting steam goods. It resembles silver in appearance and is very brittle. It possesses the quality of hardening copper without impairing its ductility, thus rendering castings easy to machine. It is particularly recommended in the manufacture of steam and water goods, locomotive and car brasses, injector bodies and trimmings, and such class of work as requires a dense, tight metal. The addition of Bassite produces a rich, uniform and lustrous casting which takes a very high polish.

NEW METAL SPINNING LATHE.

While the spinning lathe here illustrated does not differ in general appearance from others for like work, yet it embodies features of marked improvement. The lathe is built by the Good Manufacturing Company, of 65 Fulton street, Chicago, Ill. It is a large and substantial tool designed for heavy work. When the gap is closed it swings 25 inches and with the bed extended and the gap open the swing is 60 inches. The bed is extended and closed by means of a hand wheel and screw.



NEW METAL SPINNING LATHE.

To successfully withstand the end pressure in heavy spinning work, a roller thrust bearing is provided. The spindle has two cones, the front one being in one piece with the spindle and the rear one a sliding fit on the reduced end of the spindle and prevented from turning by a key. Provision is made for adjusting both cone bearings at the same time and at one operation. A quick release is provided for the spinning screw. This device allows a piece of work to be removed from the lathe and a new blank inserted without stopping the machine, thereby affecting a saving in time of about 25 per cent. on small work, due to the high speed at which these lathes run.

With the lathe is supplied a complete countershaft, spinning rest and one roller bearing center, and when specially ordered the lathe is equipped for oval work.

NEW ROLLING MILL OF J. SHONBERG.

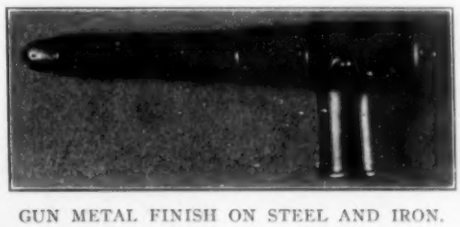
J. Shonberg has been established for many years at 363 Hudson avenue, Brooklyn, N. Y., manufacturing and dealing in type and bearing metals, Babbitt, white bronzes, etc. One of his specialties is the "Diamond S" white bronze which can be rolled from an ingot 1½ inches thick down to 25 gage. This metal is used extensively for thrush bearings, automobile bearings, and has a wide and growing field, both on account of its quality and the extreme accuracy of the mixture at all times. Another line for which the firm is noted is music plates, which are composed of tin, antimony, copper and a little lead. These are made in sizes from 8 by 11 to 10 by 14 inches, and are used in printing music. A Monarch furnace has been provided for the melting of copper alone, and the melting pots have a capacity of 15,000 pounds per day.

Mr. Shonberg has lately added a rolling mill to his equipment embodying all the latest improvements. This will roll sheets to any gage and up to 23 inches wide, and any particular gage can be duplicated exactly. The mill is driven by an electric motor. This addition permits the delivery of rolled sheets on the same day the metal is received. Metal sent in to be rolled is first weighed and the same weight in rolled sheets is returned.

The firm has been always careful about the composition of its mixtures. Any white metal can be made from a particular formula and when necessary an analysis is made of a sample of the composition required and the mixture then duplicated. This accuracy is of the utmost importance and is appreciated by the trade.

BLACK GUN METAL FINISH ON STEEL AND IRON.

The U. S. Electro-Chemical Company, of 78 Lafayette street, New York City, have been successfully manufacturing electro-plating salts for several years. An extensive trade has been built up for these salts, which are produced in the widest range, so that any possible finish



GUN METAL FINISH ON STEEL AND IRON.

can be obtained by simply dissolving the salts and then proceeding in the usual manner. Gold salts are made for the following finishes: Roman, rose, orange rose, green, antique green, red, old English, and many others.

More recently the company have undertaken the manufacture of gun metal finish on steel and iron, an example of which is presented in the engraving of the handle on this page. It is not the intention of the company to do this work but to sell the formula to shops looking for new and novel finishes for their articles. The formula is easy to operate and the results are assured.

EDITORIAL

OLD SERIES VOL. 13, No. 11. NEW YORK, NOVEMBER, 1907. NEW SERIES VOL. 5, No. 11.

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COPPER AND BRASS

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ADVERTISING RATES ON APPLICATION

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CONTENTS

COPPER.

The tug-of-war is over and the producer of the metal copper has been vanquished; the consumer wins; and the result is that copper to-day sells in the neighborhood of 14 cents per pound.

Last January and February we quoted Lake copper, car load lots, at 25.50 cents per pound. In March the price reached 26 cents; in April it was 25 cents; in May 26, in June 25, and in July 24. During these six months there was practically no demand for the metal, consumers buying in a sort of day to day manner; future dealing, even to the extent of a month or two, was eliminated completely. Of buying and selling there was none; the only thing healthy about the market was the price.

The decline really began in August when the price fell to 21 cents; in September it was 18, and at the first of October we quoted copper at 14½ cents per pound. During the latter part of the month copper sold at 11½ cents, the low water mark. On the 7th, when our report was written, we said: "A month ago the copper market was around 17.50 to 18 cents per pound for Lake and Electrolytic, the price having been cut 4 cents per pound during the month of August. Production is being cut down and heroic measures are being taken to stop any further decline, but the effect of these drastic measures cannot be felt for some months yet, and in the meanwhile the supplies of copper are more than the market can stand, and to-day, at around 14 cents, the market is weak and unsettled." We then said: "The market to-day looks like 12½ cents and unless demand improves considerably present prices cannot hold."

Our prophecy was verified on October 22 when the price of copper reached 11½ cents.

Our quotations for this issue show copper firmer at 14½ cents for Lake and Electrolytic, and from 14 to 14½ for casting brands. That consumers were prepared to buy, if the price were reasonable, is shown by the fact that sales amounted to millions of pounds with the price near 12½ cents. The market has always been receptive, but not with the price around 20 cents; the metal has always been needed, but was not obtained while the price remained so disproportionate to the real value.

For some time past the home market has been kept unsteady by reason of the selling abroad of American copper at prices below New York quotations. Despatches from our British correspondent state that the collapse in the price of copper has had a disastrous effect upon the Birmingham brass trade. Consumers in all directions are waiting for settled prices, and if they order anything the transaction consists of only "just a few pennyworths." "If an order of any size is in the market the unfortunate

maker is entirely at a loss how to quote, because he can only guess vaguely the price of metal when the time comes to execute the order. His only consolation is that his competitors are no better off, but this is a very unsubstantial solution for idle mills and shops and unemployed work people."

Consumers have very probably loaded up at prices around 12½ to 14 cents since they know that the curtailed output at the mines will not be felt until about January—that is, the production of raw metal during November will not be available on the market until the first part of the year. According to the Boston News Bureau the five principal consumers in this country require the following quantities:

American Brass Company	250,000,000
Roebling & Sons Company	100,000,000
General Electric Company.....	75,000,000
American Steel & Wire Company.	50,000,000
National Conduit Company.....	50,000,000

Taking this consumption of 525,000,000 from the total production leaves for all other consumers 126,211,358 pounds.

The fall in price broke the deadlock which had existed for months between producers and consumers and it is estimated that at least 100,000,000 pounds of copper was sold in one or two days' trading on the New York market alone; this made a very appreciable inroad into the surplus which has been taken quite generally to be around 300,000,000.

Ten years ago—1897—Lake copper sold for 11.29; the price gradualiy increased to 17.61 in 1899, then fell to 11.89 in 1902; it was 12.99 in 1904, and last year was 19.62. During the same period the consumption of pig copper in the United States increased from 245,000,000 pounds to 596,944,000 pounds in 1906.

An interesting study could be made of the actual value of ores at the different market prices. Lean ores can be profitably worked with copper over 20 cents, but it would be ruinous to handle them with copper below 15 cents. In addition to this, ores that could be handled ten years ago with copper at 12 cents cannot be touched now with the metal at the same price—the cost of mining, extraction and marketing has so advanced as to make this prohibitive. Rich deposits are, to a certain extent, independent of the market, provided the rate of profit is satisfactory; but poor ores, which are in the majority, must remain idle during low markets.

Some months since, when the price of copper was forced up, it was confidently anticipated that the large consumers would be compelled to purchase the metal. It was thought that trade conditions were such that manufacturers would be obliged to obtain copper in order to carry out their contracts. But the calculation proved to be wrong because the premises were untrue. The consumers found they could get along with buying only in comparatively small amounts, quite contrary to the expectations of the miners. Manufacturing was curtailed as far as it was possible to do it and still maintain the business; but buying for the future was a feature of the trading that was foreign to the market. The result is known; the market fell, and at the reduced prices producer and consumer came once again together and did business. Judged now, the entire forcing up of the price of copper was the outcome of the belief that the consumer would be compelled to buy, willy nilly, to keep his plant running; the consumer nibbled at the bait, but he failed to swallow it at one gulp. He kept his works in operation, while the producer piled up the raw material which is now coming on the market.

Whether or not the consumer would be compelled to purchase depended upon the supply of raw material he had on hand and the nature of his manufacturing obligations. An inadequate stock of metal, or specified deliveries for large quantities of his product, would have forced him to accept the exorbitant rates. It is now evident that the five great consuming companies were not perched on either horn of the dilemma—they continued along the even tenor of their business way and there was no worrying, at least of a public nature, about supplies. The climax approached; the producers quit the game, and—the bottom fell out of the copper market.

THE BUSINESS SITUATION.

The business situation for the past month may be summed up in the statement that the country is sound industrially, but weak financially. To verify this statement anyone has but to visit the various industrial works of the country and he will find machinery people invariably report they have work enough to last months or a year, and though there has been a slackening of new orders, this has not been looked upon askance as it has given them an opportunity to catch up to a certain extent and, as stated, enough new work has come in to keep them busy.

Of course, a number of the metal industries which are large buyers of copper have simply stopped operations until the price of this metal is on a settled and reasonable basis. The market now being in better shape, a great quantity of the metal having been exported, consumers are beginning to buy and with steady conditions it is probable that all of the industrial works which have been affected by the copper market will again be in full operation.

The plating industry reports a rather dull trade, but undoubtedly this could be traced to the conditions of the metal market just mentioned, and the promises are that this trade will be busy again when manufactured metal goods are once more produced in quantities. The demands of the holiday season, which is now at its height, will no doubt act as a further stimulant.

The outlook, therefore, is good for all industries which are in no way dependent upon the financial center of the country for the maintenance of their prosperity, or, in other words, those industries that have not had to borrow from Wall Street are not probably subject to further disturbances, and those industries which have borrowed have a promise of going on again the same as before as money becomes easier in the financial adjustment.

BARYE USED SAND AS WELL AS CIRE PERDUE.

To the Editor of THE METAL INDUSTRY:

The interesting article by Mr. Lemal (THE METAL INDUSTRY, October, 1907) was no doubt read by many of your readers, for anything on this method is of interest to the craft. In reading this article I notice Mr. Lemal makes reference to Barye in which he states, "Barye always employs it." In this particular I might state that one of the most successful castings by the sand method is Barye's Lion in Mount Vernon Place, Baltimore. This was cast in one piece in Barbedienne's foundry and is a most perfect example of casting in one piece by sand molding.

I was also informed that his group of "Theseus and Minotour" was also cast by sand molding in one piece by Barbedienne, and with perfection that leaves nothing to be desired.

I write this so as to correct any wrong impression that might become extant that Barye was opposed to sand molding methods, and hope you will kindly give it space for the benefit of your many sand molding readers.

JOHN G. NIEDERER.

EFFECT OF MELTING ON STERLING SILVER.

To the Editor of THE METAL INDUSTRY:

Can you give me any information as to the behavior of sterling silver on melting? Does the silver or the copper burn out or volatilize in the larger degree? We have been old that the copper burns out, leaving the silver finer than sterling, and that in two or three remeltings this gain is quite considerable. Our experience here seems to show that the opposite is true; that is, that the silver becomes poorer and poorer with each melting.

RALPH J. MARSH.

This inquiry was referred to several of our experts with the following results.—ED.

In reference to the melting of silver it is a fact that the copper does burn out from constant meltings. The silver may not be so good to work after being melted several times, but the grade is still there. I think if an analysis was made of the silver mentioned it would be found to be better than sterling silver 925/1000 after repeated meltings.—E. E. N.

It is a fact that copper does burn out from constant melting of silver. Silver may not work as readily after several meltings, but the grade is the same. I believe he would find his silver better than sterling.—U. N. K.

Will say there is a loss of copper in continuous remelting and more or less loss takes place from constant annealing due to the oxidation of the copper in the silver, although in very small quantities we suppose if remelted often enough and rerolled most all the copper would disappear, and therefore the fineness grow finer all the time. There is also a small loss from volatilization in heating; as the pouring point is reached the gases are charged more or less with very small particles of silver, discernable only through a very powerful microscope. The silversmith always considers that remelted scrap makes the best stock. —C. S.

It is a well known fact that copper produces a denser oxide than silver, which is almost imperceptible when annealing; whereas copper annealed in the same manner would be covered with a copious black oxide of copper. With continuous heating of sterling to the fusing point the copper, on account of its more rapid oxidation, naturally burns out, while the silver remains intact.—C. H. P.

NEW BOOKS.

GOLDSMITHS' AND SILVERSMITHS' WORK. By Nelson Dawson. (The Connoisseur's Library). Royal octavo; uncut edges; pages xx, 267. 127 illustrations. G. P. Putnam's Sons, New York and London. $7.50 net.

Much can be said in commendation of this very elegant volume treating of art work in gold and silver. The author approaches his subject from the view point of the artist and craftsman, for the reason that "one is obviously drawn to consider the fine pieces of workmanship that have come down to us from older times, and these are, or, until quite recent days, when museums have sprung up on every side, have been in the hands of private collectors. It follows, then, that a writer on the subject is somewhat dependent on the fancy of those who had made the collection."

An examination of this book and of the examples of metal work pictured will go far toward convincing those not expert along this line, that other artists and craftsmen beside the Greek, Roman and Etruscan understood and were capable of executing some of the most beautiful specimens of art metal work. We are also impressed with the fact that the workmen of old had methods and processes of which we are ignorant to-day. As pure specimens of artistic design some of the old objects are not surpassed by any work done now, and this purity of ornamentation is not by any means confined to nations considered cultured. One of the illustrations is of an Etruscan gold cup, the outside of which is divided into spaces by vertical flutings, the spaces being filled in "with that granular work for which this period (fifth century, B. C.) and district were so noted." The author says: "The manner in which the ancient workers made this granulated work, which consists of lines of distinct and individual grains soldered on side by side in a marvellous way, has never been satisfactorily explained. It may have been the product of extreme patience, but one inclines to think that they had some little method, of which we know nothing, that simplified the process. It is certain that this particular form of enrichment has never been so successfully used before or since."

The arrangement of the matter is such that there is first presented studies of ancient pieces of art metal work; the influence of these upon more recent specimens are then mentioned. In this manner we can see the influence of the early designs and workmanship upon gold and silver work of later times. The subjects for illustration have been carefully selected and the details are clearly brought out in the engravings. The author treats his subject with the accuracy of the expert and the enthusiasm of the artist.

CORRESPONDENCE

IN THIS DEPARTMENT WE WILL ANSWER QUESTIONS RELATING TO THE NON-FERROUS METALS AND ALLOYS. ADDRESS THE METAL INDUSTRY, 61 BEEKMAN STREET, NEW YORK.

METALLURGICAL.

Q.—We want a mixture of aluminum that will stand nitric, citric and tartaric acid. We have found that aluminum tubing will stand these tests and what we want is a casting that will do the same.

A.—The reason aluminum tubing will resist corrosion so well is because of the purity of the rolled metal and also because of its smooth surface. As soon as aluminum obtains a rough or mat surface it will corrode more rapidly. No alloy of aluminum will resist corrosion as well as the pure aluminum. You should use the best grade obtainable for your castings and give them a smooth surface by using on the patterns a good facing as is done with stove plate castings.

Q.—In the manufacture of our work we have a great amount of light yellow brass turnings and while all of our castings are made of red brass and are very light, we are at a loss to know how to use this yellow brass to advantage. In making our castings the difficulty we have is this: We find that it is very hard to run and it is stiff and sluggish and will not run freely like red brass. We also have difficulty in machining, as the particles stick to the drills and wear the edges off very quickly.

A.—We would first advise putting the turnings through a magnetic separator. Then run down into ingots in large crucibles, making a bath at the bottom of the crucible by melting up some gates. Add enough copper to bring the composition up to red brass standard and about 2 pounds of tin to insure free running. If you use a Schwartz furnace, pole the metal well before running into ingots.—J. L. J.

Q.—We have fitted up our foundries to make ingots from brass turnings. We would like you to let us know about what percentage of spelter you would use to 100 pounds of brass turnings, in order to obtain a first class brass ingot.

A.—We would say that if a yellow brass ingot is meant and the turnings are yellow brass turnings, only enough zinc should be added to make up the loss by volatilization. With careful melting this loss ought not to be more than 2 or 3 pounds to the hundred. The zinc will also deoxidize or clean up the turnings to some extent.—J. L. J.

Q.—Can you tell us what brass foundries usually figure the total cost of labor, shop use, coke, crucibles, etc.? We are trying to find what would be a fair percentage to pay brass foundries for making our castings, we to furnish the material which is all clean scrap, either copper or borings from screw machines. For some time we have been doing our own molding, but we do not have enough to keep a good man busy and are thinking of having the work done outside, at the same time we do not want the cost of metal to enter the transaction, as we prefer to furnish this.

A.—We would say that the cost of labor, coke, and crucibles, including melting loss, to put brass into castings, varies considerably with different firms, but may be said to be from 3 to 6 cents per pound. The average cost to a large manufacturing concern has been 4.8 cents per pound for a number of years. If borings from screw machines are used the melting loss would be rather high.—J. L. J.

MECHANICAL.

Q.—What is the best lubricant for drawing brass tubing?

A.—There are several lubricants more or less good. Lard oil is the best but expensive, but it can be used for drawing any kind of tubing, including bronze. I find that whale oil soap is cheap and serviceable for brass tubing, mixing it with water in the proportion of 20 pounds to the barrel. In general it may be said that any animal oil is good for drawing brass tubing, while mineral oil is not.—F. W. F.

PLATING AND FINISHING.

Q.—(1) I would like a formula for a French gray for flat ware other than the platinum or liver of sulphur method. I am looking for something better than the liver of sulphur method and cheaper than the platinum. (2) Do you know of anything better for a bright silver solution than bisulphide of carbon and chloroform?

A.—(1) Many platers are using a mixture of chloride of iron and chloride of platinum, in the proportion of 1 part of the iron to 2 of the platinum, and claim to get just as good results as when using all platinum. The nickel gray solution is also being used extensively. This consists of a regular nickel solution consisting of 8 ounces double sulphate of nickel and ammonia and 1 ounce sulphate nickel to each gallon of water. Then saturate the same with common salt. This gives a very good gray, but not black. The work need only be flashed in the manner of a silver strike. (2) Try benzole and use it in the same manner as the bisulphide of carbon. This stays in the solution better, and also gives better results.—C. P.

Q.—Kindly let us know how to rig up an electric cleaner and also name the ingredients of the solution.

A.—We refer you to the article entitled "Electro-Chemical Cleaning Baths and Their Uses," by Charles H. Proctor, in the October, 1905, issue of THE METAL INDUSTRY. Also in our Criticism and Comment Department, page 180, for June, 1907, a very good electric cleaner is given by M. S. Hemse, and the method of using it is described. Another formula which can be used in the same manner as that of Mr. Hemse is composed as follows:

Caustic soda	8 ozs.
Cyanide of potassium	4 ozs.
Water	1 gal.

Q.—Kindly advise us whether it is best to use copper or bronze commutators on dynamos for plating, and why?

A.—Bronze metal commutators for dynamo purposes are now used extensively. They consist of 90 copper and 10 tin. The preference over copper is that they are

harder, and consequently wear longer. Brushes are also being made of this mixture and are found superior to sheet copper in their wearing qualities. They do not burn so easily, and therefore keep the commutator in a smoother condition.—C. P.

Q.—My silver solution is alkali. What shall I do to make it natural? My anodes turn brown, with black specks all over.

A.—If your solution contains too much free alkali in the form of carbonate of potash add ¼ ounce of 3 per cent. hydrocyanic acid to each gallon in use. If your anodes become clear, do not add more. If not, the amount may be increased to ½ ounce.—C. P.

Q.—Can you give me a formula for bright dipping zinc articles? Either an acid dip or a solution that would deposit a thin film of some of the brighter metals by simple immersion would answer the purpose.

A.—You might try the following: Sulphate of aluminum and ammonium (ammonia alum) 14 ounces; chloride of tin 1 ounce, dissolved in water 1 gallon. Use the solution boiling. This will give you a thin coating of tin upon the galvanized surface and should improve the tone of the articles. This solution may be renewed by adding a little of the tin salt occasionally.—C. P.

Q.—Could you give me a good dip for brass plated work, before putting it in the gold solution? We are following this method: After giving the iron a good coat of brass we dip them; then buff and afterward put them into brass flushing tanks to bring up a nice bright color. I am under the impression that instead of flushing them we could have some kind of bright dip.

A.—Try the following formula for the purpose mentioned; this should be prepared at least a day before using:

Aqua fortis 38	2 gals.
Oil of vitriol 60	1 gal.
Muriatic acid	2 to 4 ozs.
Water	1 gal.

Cleanse your work and then pass rapidly through the dip, which should be kept as cool as possible. A number of firms use the following method: Copper plate the articles heavily; pass through a good acid dip; color with soft buffs; cleanse in the usual manner and flash in a hot brass bath containing 3 parts copper to 1 part zinc and using anodes of 85 parts copper and 15 parts of zinc cast in sand. This bath should be about 5 degrees Baume. The color approaches gold and gilds very freely.—C. P.

Q.—I want to make a die to be used in a heavy press. I have made them of copper, but that metal, being so soft, does not stand up well. I want to try iron. Can you tell me how to start it. In copper I take the soft metal pattern and make a regular electrotype. Can I treat it the same way with iron?

A.—To produce a deposit of iron suitable for your purpose a solution consisting of the following could be used:

Sulphate of iron, commercially pure	5¼ ozs.
Sal ammoniac	13½ "
Water	1 gal.

After preparing the solution add 2½ to 3½ ounces of citrate of ammonia to prevent the deposition of iron and basic iron salt upon the anode. A current strength of 2 volts should be used. Anodes of wrought iron as large as possible should be employed. Better results will be obtained if you proceed in your usual manner by first producing a thin deposit of copper and then immersing in the iron solution until a deposit sufficiently heavy is obtained. It is desirable to give a slight motion to the bath and if possible force a current of air through the solution; this gives the best results.—C. P.

Q.—Kindly tell me how to frost glass with glue and what kind of glue?

A.—Glue is not used in producing imitation of frosted or ground glass. The formula used for frosting electric light bulbs, or any other glass surface, consists of

Gum sandarac	2½ ozs.
Gum mastic	½ "
Ether	24 "
Benzine	18 "

To prepare, dissolve the gums in the ether by agitation and then add the benzine. The articles to be frosted must be dipped in or the mixture poured upon the surface, as brushes cannot be used.—C. P.

Q.—(1) Is it possible to nickel plate, instead of copper plate, work which is to be silver plated? If I can do this I can save a good deal of silver. I have tried this but the silver does not adhere in some places and in others it is all right. (2) How can I get good results on knives; also I have trouble with the nickel peeling off skates.

A.—(1) In depositing silver upon silver plate it is necessary to use a silver strike with a strong current. To accomplish this prepare a strike consisting of ¼ ounce of silver chloride and 6 ounces cyanide to each gallon of water, using a regular silver anode. Nickel plate your work in the regular manner and wash well. Then immerse in a sour water consisting of 4 ounces muriatic acid to each gallon of water; rewash and place in the strike solution, using a strong current for a couple of seconds. Then immerse in the regular bath until the deposit is sufficiently heavy. (2) Use an electric cleaning solution rigged up in an iron tank, connecting the positive wire to the tank, making it the anode. Prepare the solution from ½ pound caustic soda and ½ ounce of cyanide to each gallon of water. Immerse your cleansed knives or skates in this solution, using a strong current for two or three minutes; wash in water and plate in the regular manner.—C. P.

Q.—Please give us the formula for putting an inexpensive dip imitation ormolu finish on brass shell work.

A.—Prepare a satin dip as folows:

Oil of vitriol	1 gal.
Aqua fortis	1 "
Sheet or scrap zinc	6 ozs.

First dissolve the zinc in the aqua fortis and when cold add very slowly the oil of vitriol. The dip is used warm and must be continually stirred for the best results. It often happens that a new dip does not produce results at once, but by adding a little water and muriatic acid action develops readily. Cleans the work in the usual manner and immerse in the satin dip for several minutes. Then remove, wash and pass through the regular bright dip. Dry out and use a transparent or satin finish dip lacquer. For gold effects, after lacquering and when thoroughly dry, a gold dye is used. This may be obtained, together with instructions as to how to use it, from manufacturers of lacquer.—C. P.

Q.—Please give me a formula for producing the ormolu finish, similar to that found on chandelier work.

A.—A formula for an ormolu dip suitable for your purpose will be found on page 2 in the January, 1906, issue of THE METAL INDUSTRY. The article is entitled "Matt Satin Finish on Brass Novelties." This is the regular method used on chandelier and lamp work.—C. P.

Q.—Can you tell me the dip to use to produce the back ground as on the sample name plate sent herewith? I have tried copper and ammonia, but they did not work satisfactorily.

A.—We have made several experiments with the name plate submitted and are satisfied that the black deposit is produced in the ammonia-copper bath which, if correctly made, will give a black exactly like the sample. If you will consult THE METAL INDUSTRY for May, 1905, you will find on page 88 an article on oxidizing brass by immersion in the ammonia-copper solution. The formula given will produce the results you are looking for. In using the solution we would advise you, after oxidizing the plate, to immerse in a 10 per cent. solution of caustic soda used hot. This sets the black and produces a deeper tone. You might try the following formula, used warm: Acetate of copper, 2 pounds; carbonate of ammonia, 2 pounds; sal soda, 2 pounds and water 4 gallons.—C. P.

Q.—I would like information in regard to a compound for coloring on bronze. On the sample sent you you will notice one side quite dark, having an old look; this is what I want.

A.—The sample color is known as structural bronze. To produce this the work is usually finished with 100 or 120 emery, cleaned in the usual manner and then immersed in a solution consisting of 1 ounce red sulphide of antimony and 3 to 4 ounces caustic soda in each gallon of hot water. After a few seconds remove the articles, wash and dry out and then scratch brush dry with a fine wire brush. If the color is dark enough wax by dissolving beeswax in turpentine to a very thin paste; immerse the articles or apply with a canton flannel. If the color is not dark enough make a second solution about one-third the strength of the first and use cold. After the scratch brushing pass rapidly through the second solution and wash and dry; do not brush the second time. Your sample we have refinished and waxed in this manner.

Q.—We desire to coat small articles made of crucible steel with copper by dipping.

A.—A solution composed of 4 ounces of sulphate of copper and 4 ounces sulphuric acid in 2 gallons of water will copper articles of iron or steel, much must be previously cleaned from impurities. Small articles can be best copperized by tumbling in maple sawdust moistened with a very dilute solution, using one part of the above to two parts of water. The following method might also prove satisfactory: Dissolve ¾ pound crude cream of tartar, known as argol, in each gallon of boiling water, then add 3 to 4 ounces carbonate of copper. The solution must show an acid reaction. Immerse the articles in the hot solution for a few seconds; wash and dry in the ordinary way.—C. P.

Q.—Will you have the kindness to let me know a method for cleaning and polishing articles made of terne plate? These articles have a large surface and are stamped out on a large press. A buff seems to take off the thin lead coating, no matter how slowly it is run.

A.—Use a soft buff with whitening or Vienna lime mixed with kerosene oil. For finishing use a little of the dry powder applied to the buff only. As a rule the lead is very thin and is easily cut through when any tripoli or crocus compositions are used.—C. P.

Q.—I should like to know a remedy for keeping cold rolled copper from looking porous after being plated. I have some coffee urns made of this copper and after they are plated they look porous.

A.—If you produce a satisfactory surface by polishing first this appearance should not occur. It may be due to hydrogen gas forming globules upon the surface when plating; if this is the case your solution is too low in metal; add at least 2 ounces single sulphate of nickel to each gallon of solution. Also see if your anodes are sufficiently clean; if not boil them out in water and scrape them; this method will probably overcome your trouble.—C. P.

Q.—I have an inquiry for a solution which will give iron a copper appearance without the use of electricity.

A.—If articles of gray iron are first thoroughly cleaned in the usual manner and then immersed for a second in a solution consisting of 1 pound sulphate of copper, 8 ounces oil of vitriol and 10 gallons of water they become coated with copper. Small articles are sometimes coated by moistening maple sawdust with a little of the solution and tumbling in a regular tumbler for a few minutes; afterward they should be dried out in the ordinary way.—C. P.

Q.—(1) Please give me a good cyanide copper solution for plating steel and soft metal and (2) the best nickel solution for general job work.

A.—(1) A good cyanide copper bath for your purpose and one that will deposit without blistering on soft metal consists of

Water	1 gal.
Cyanide of potassium	6 ozs.
Red copper compound	2 "
Bisulphite of soda	2 "

Dissolve the cyanide in lukewarm water and then add the copper compound. Mix thoroughly and add the soda salts. Use anodes of electrolytic or cast copper. To renew prepare a concentrated solution of cyanide in cold water, then add as much copper as the solution will absorb, and add to your bath as required; at the same time add a small amount of bisulphite of soda. (2) A good nickel solution for general job work is

Water	5 gals.
Double nickel salts	2½ lbs.
Single sulphate of nickel	6 ozs.
Boracic acid	1 "

Dissolve the nickel salts in about ⅓ the water, boiling, then add the balance of the water cold. To repair the solution add 2 ounces of the single sulphate of nickel to each gallon. Add nothing more as long as the deposit is white and uniform; when the articles show dark lines or streaks a conducting salt will be necessary. For this purpose add 2 ounces common salt to each gallon of solution, or the same amount of sal ammoniac or sulphate of ammonia.—C. P.

Q.—Can you inform me of a concern that will plate very heavily with platinum, steel wire pins, gauge 20 and ⅛ of an inch long.

A.—A fairly heavy deposit can be obtained in a well regulated platinum bath by first coating the steel wire with copper. We are not aware of any concern that does platinum plating as heavy as you desire. Platinum is very largely used for color effect on jewelry.—C. P.

METALLURGICAL DIGEST

A REVIEW OF METALLURGICAL MATTERS OF THE WORLD.
TRANSLATED AND EDITED BY HOWARD GREEN BAYLES, MET. E.

A GERMAN BEARING METAL.

Metallurgie (German) gives the results of careful tests made on two bearing alloys. The tests for wear were made by casting a circular disk of the alloy 6 feet in diameter and 1 inch thick. This was mounted on a horizontal axle and the edge turned smooth. A steel tool with a square flat end was pressed on its upper edge with a pressure of 1,000 pounds. The disk was rotated 550 times per minute for 1 hour, and the loss of weight of the alloy calculated per square inch of the wearing surface.

Composition.	Melting Point.	Compression under 30,000 lbs. per. sq. in.	Loss of Wt. per. sq. in. friction.
Tin, 83.33..... } Antimony, 11.11.. } Copper, 5.55..... }	440° F.	1.68 mm.	.01 grams
Aluminum, 91.7... } Copper, 7.61..... }	1,160° F.	.81 mm.	.003 "

The comparison of the first costs of these two alloys is not given, but would be, at normal metal prices, about 2 cents per pound more for the former than the latter.

GRINDING AND POLISHING WHEELS.

Der Metallarbeiter has an interesting article on grinding and polishing. The preparation of a grinding wheel is described as follows: After turning a wooden disk, leather is pasted to its edge. The grain side of the leather is placed against the wood, and the ends are shaved down, or "scarfed," in order to obliterate the joint as far as possible. The best glue is used, and tacks are driven through the leather to hold it smoothly in place until the glue has hardened. After 24 hours the tacks are removed, and the leather turned down to a true circle. A thin paste is made of glue mixed with whatever grade of grinding powder is to be used on the wheel, and the leather is painted smoothly with this. After partial drying, the wheel is rolled in a pan containing the same sort of grinding powder, and is set in a warm place to dry thoroughly. When the first coat is quite hard, a second is applied in the same way, and this is repeated four or five times. In grinding, the wheel is freed from particles of metal from time to time by holding a piece of sandstone against its periphery for a few minutes.

For articles of more complex shape, where such a wheel as the one described could not well be used, a wheel of fibre bristles is used, with a rather thick paste of machine oil and grinding powder.

For polishing, gentler means must be used, as felt wheels, rag wheels of cotton or muslin; for still finer work, rag wheels of woolen cloth, and finally wheels of soft rawhide. In order to have the polishing proceed rapidly, some preparation must be used on the wheel. Formerly a mixture of pure white chalk and stearin oil was generally used. The chalk was unreliable in fineness, and with increased use came general adulteration of the oil. The best plan to-day is to use one of the many polishing pastes prepared by reliable manufacturers, a little experimentation being sufficient to find out which are best adapted to ones particular needs.

Our attention has just been called to a German patent issued on Nov. 10, 1906, to Schoop, which covers certain fluxes that make possible the autogenous welding of both aluminum and nickel. The difficulties to be met hitherto have been that aluminum covered itself with a thin film of oxide that prevented adhesion, while nickel absorbed oxygen from the air, making the neighborhood of the joint weak. These two fluxes are now being made by the firm of Schoop-Garenne-Colombes at Paris. The nickel flux fuses and covers the metal from any contact with the air, while the aluminum preparation exerts not only the same covering action, but tends to reduce any oxide that may be formed as well.

ENGLISH PRACTICE IN NICKEL AND SILVER PLATING.

The *Blacksmith and Wheelwright* (an English publication) prints a very careful and instructive illustrated article on nickel and silver plating. It is too long to reprint and rather too elementary to reward making a résumé, but the baths recommended may be of interest.

COPPER ACID BATH.

Copper sulphate (blue vitriol)	1 lb.
Sulphuric acid	1 "
Water	1 gal.

COPPER CYANIDE BATH.

Copper sulphate	8 oz.
Ammonia	as directed below
Potassium cyanide	1¼ lbs.
Water	3 qts.

Dissolve the copper sulphate in 1 quart of hot water. When cold add to it ammonia, a little at a time, until the precipitate formed at first is redissolved. Dissolve the cyanide in 2 quarts of water and add this solution very slowly to the other until the blue color disappears. The rest may then be added at once. Allow to stand until all sediment has settled to the bottom. Then siphon off the clear liquid for use in plating.

SILVER CYANIDE BATH.

Silver cyanide	2 oz.
Potassium cyanide	4 "
Water	1 gal.

Dissolve the salts separately and mix slowly.

NICKEL AMMONIA BATH.

This is very simple, it being only necessary to dissolve 12 oz. of the double sulphate of nickel and ammonium in a gallon of water. Add to this 1 oz. of common salt. In order to produce a very bright plating on cast iron give it a thorough cleaning in the following pickle before plating in the above bath:

Sulphuric acid	1 lb.
Water	1 gal.
Zinc	¼ lb.
Nitric acid	½ "

These ingredients should be mixed in the order in which they are given, care being taken that the zinc is fully dissolved before adding the nitric acid.

SOLUTION FOR ETCHING ON GLASS.

La Photo-Revue gives two formulæ that may be used to make solutions that will etch glass and may be used for writing permanent labels, etc.:

(A)	Sodium fluoride	86 grains
	Potassium sulphate	7 "
	Water	1 oz.
(B)	Zinc chloride	14 grains
	Hydrofluoric acid	65 drops
	Water	1 oz.

Either is mixed only when needed for use and is applied with a quill pen or camel's hair brush. Neither, of course, can be kept in a glass bottle and does not keep its strength if kept for any length of time, no matter what its containing vessel. A rubber tray may be used for mixing them or a porcelain "evaporating dish," the inside of which has been coated with paraffine.

English patent No. 25,966, 1906, relates to a method of protecting silver against tarnishing. The silver article is coated electrolytically or otherwise with a metal such as zinc, which will form an alloy with the silver and is not blackened by suphur. The article is then subjected to pressure by immersing it in water or oil and establishing a hydrostatic pressure. This would not distort it, but would consolidate its coating, provided the same were sufficiently impervious to the liquid.

Associations and Societies

REPORTS OF THE PROCEEDINGS OF THE METAL TRADES ORGANIZATIONS.

AMERICAN BRASS FOUNDERS' ASSOCIATION.—Charles J. Caley, president, New Britain, Conn.; Andrew M. Fairlie, secretary, McCays, Tenn.; John H. Seeler, treasurer, Philadelphia, Pa.

In spite of the financial tangle and the banking crisis, the American Brass Founders' Association continued to grow during the month of October. The new members for the month are as follows:

Chas. H. Besly Co., Chicago, Ill.
Henry E. Pridmore, Chicago, Ill.
Ashcroft Mfg. Co., Bridgeport, Conn.
Ohio Brass Co., Mansfield, O.
Ajax Metal Co., Philadelphia, Pa.
Wm. Newton Best, Brooklyn, N. Y.
J. W. Mack, New York, N. Y.
Seymour Mfg. Co., Seymour, Conn.
The Robt. Mitchell Co., Montreal, Can.
Adams & Westlake Co., Chicago, Ill.
North & Judd, New Britain, Conn.
A. S. Cameron Steam Pump Works, New York, N. Y.
Russell & Erwin Mfg. Co., New Britain, Conn.
Landers, Frary & Clark, New Britain, Conn.
Clum & Atkinson, Rochester, N. Y.
Whiting Foundry Equipment Co., Harvey, Ill.
Crescent Mfg. Co., Scottdale, Pa.
A. Y. McDonald & Morrison Mfg. Co., Dubuque, Iowa.
The Iron Age, New York, N. Y.
Maryland Steel Co., Sparrows Point, Md.
Chas. H. Proctor, Arlington, N. J.

The Association now comprises over ninety members, and the success it has already achieved, in the face of the business depression and financial worries of the past few months, only goes to show that this banding together of the non-ferrous metal interests for the purpose of industrial education is what the metal men have been waiting for.

The first annual convention of the Association will be held early in June, 1908—probably at Toronto, Can. More definite information regarding the convention will be published on this page next month.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS, Engineering Societies Building, 29 West 39th street, New York City.—The fifty-fourth annual meeting of this society will be held in their building December 3-6, 1907. Symposiums on foundry practice, giving the experiences of prominent men in that work, have been arranged. The specific heat of superheated steam will be taken up, a very important and exhaustive work by a professor of engineering at Cornell will be presented. The utilization of low grade fuels in gas producers, combustion control in gas engines, tests of producer gas engines, etc., will be given a session. Other live topics, such as industrial education, power transmission by friction driving, cylinder port velocities, etc., will be discussed. All of these subjects have been treated by prominent engineers of Europe and America, professors of our universities, and men eminent in the particular work of which they write. The committee have on hand an interesting excursion for Wednesday afternoon, and an address in the evening which will be especially enjoyable.

The reference libraries of the American Institute of Electrical Engineers, the American Society of Mechanical Engineers, and the American Institute of Mining Engineers, having headquarters in the Engineering Building at the above address, are now open evenings until 9 o'clock on all week days except public holidays. The libraries constitute practically one library of engineering, and are available to members of the above societies, engineers, and the public generally, subject to proper regulations. Strangers are requested to bring letters of introduction from members or to secure cards from the secretaries for the respective societies.

NEW ENGLAND MANUFACTURING JEWELERS' AND SILVERSMITHS' ASSOCIATION, 42 Weybosset street, Providence, R. I.; president, Harry Cutler; treasurer, Harry M. Mays; secretary, Everett L. Spencer.

At the annual meeting of this association, held last month, the following officers were unanimously elected:

President, Harry Cutler; vice-presidents, Theodore W. Foster, Albert A. Bushee, George K. Webster; treasurer, Harry M. Mays; secretary, Everett L. Spencer; board of governors, Roswell C. Smith, Frank E. Reynolds, George H. Holmes, Thomas S. Carpenter, Charles T. Paye, William P. Chapin, Arthur O. Ostby, Everett I. Rogers and William A. Schofield.

President Copeland then conducted the newly elected president to the chair, when the latter thanked the members for the honor conferred upon him and solicited the liberal support of all the members. The retiring president then reviewed the good work being done by the association, after which first vice-president discussed the apprenticeship question. Harold E. Sweet then spoke on the profit sharing system as used by the R. F. Simmons Company with its employes. Joseph A. Holland, of the Rhode Island branch of the Metal Trades' Association, was next introduced, and illustrated the card system as used by that organization in its employment bureau. Ex-President Henry G. Thresher made a brief speech, commending the merits of the association.

It was voted that the thanks of the association be engrossed and presented to retiring President Copeland, together with the gavel he had used.

The newly elected officers and the board of governors met and elected the executive committee, consisting of Frank B. Reynolds, George H. Holmes and Everett I. Rogers, and a membership committee, of Thomas S. Carpenter, Charles T. Payne, Arthur O. Ostby and William A. Schofield. The officers ex-officio are Past Presidents Henry G. Thresher, John M. Buffinton, Frank T. Pearce and William A. Copeland.

ASSOCIATED FOUNDRY FOREMEN.—President, James F. Webb, Elkhart, Ind.; secretary-treasurer, F. C. Everitt, Trenton, N. J. The meetings of the local associations have nearly all been resumed, and the programs for the next few months promise proceedings of unusual interest. The issue of the review carrying the papers and discussions presented at the different local associations, and in that way giving all the benefit, has met with the heartiest approval.

AMERICAN FOUNDRYMEN'S ASSOCIATION.—President, Stanley G. Flagg, Jr., Philadelphia; Secretary-Treasurer, Richard Moldenke, Watchung, N. J.

The secretary announces that at the recent meeting of the Executive Board, held in New York City, the invitation of the Canadian members was definitely accepted and Toronto designated as the place for holding the next convention, during the first week in June.

The Board is making a strong effort to raise a substantial fund by private subscription, with which to commence a series of investigations for the benefit of the foundry industry, in anticipation of a decision on the part of the membership at large to take up this work at the next convention as part of the Association program.

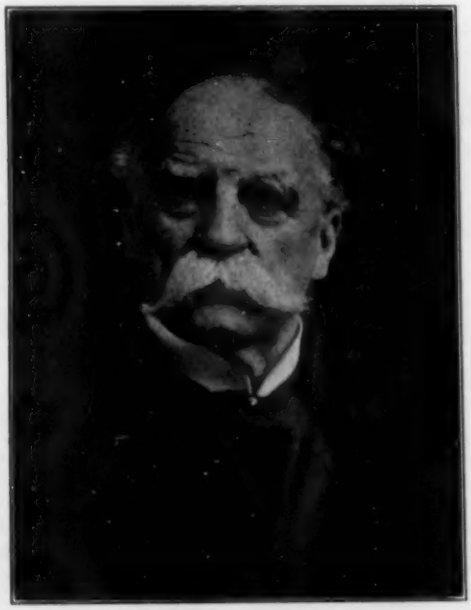
TUBING ASSOCIATION.—An association of manufacturers of the small size of seamless tubing, to be known as the Small Seamless Tubing Association, is now being formed. The objects of the society are for the mutual protection of members and for the sustaining of prices. The papers of agreement have been drawn up, though not signed at the time we go to press. The association will contain the majority of the tubing manufacturers in the United States who make small size tubes.

ITEMS OF INTEREST TO THE INDIVIDUAL.

PRESIDENCY OF SARGENT & CO.

George Henry Sargent has been elected president of Sargent & Co., New Haven and New York, thus filling the vacancy occasioned a few months ago by the death of his brother, J. B. Sargent. A merited distinction is thus given to the new president of this great corporation with which he has been so long and prominently identified, and to the upbuilding of which to its commanding position among hardware industries he has so conspicuously contributed.

Mr. Sargent has long occupied a conspicuous position in the trade, both on account of the prominence of his firm and his personal character and ability. He has always been identified with the New York house, his brother, the late Hon. Joseph B. Sargent, supervising the manufacture of hardware at their extensive works in New Haven, Conn., of which city he was formerly Mayor.



GEORGE HENRY SARGENT.

George Henry Sargent comes of sturdy Puritan stock and was born in Leicester, Mass., October 29, 1828. His ancestors were among the founders of the town early in the eighteenth century, the descendants of his progenitors being referred to in the history of Leicester as "most active and zealous of those who were in opposition to the British Parliament, were very public spirited and highly honored citizens and prominent in Massachusetts as American patriots, sharing the glory and fame as brave comrades of the heroes of '76." William Sargent was the forefather of the American branch of the family. He came from Northampton, England, to Charlestown, Mass., in 1638, and became a "freeman" and one of the important men in the colony. He was a "lay preacher" and as Johnson says in his annals of New England, "a Godly Christian." The mingled blood of Pilgrim and Puritan flows in the veins of his descendants.

After a course at Leicester Academy the subject of this sketch entered Harvard College. Among the members of his class, that of '53, were Charles W. Eliot, now president of the university; Professors Peirce, White and Hill, all connected with the university; Edward King, president of the Union Trust Company, New York; Justin Winsor, formerly librarian of Harvard, and many others who have been prominent in business and professional life.

On leaving college in 1853 Mr. Sargent came to New York and entered the hardware trade, occupying modest quarters in the third loft at 24 Cliff street, moving thence to 85 Beekman street the following year, where in 1856 the present efficient heads of departments, Thomas J. Atkins and William J. Ladd, and in 1860 George Munson, entered the employ of the house and are all now active in business. In 1863 they moved to 70 Beekman street, where they remained until 1875, when they entered upon larger quarters at 37 Chambers street. In 1879 the adjoining building, No. 35, was leased and in 1890 No. 33 was added. Condemnation proceedings by the city of their buildings, with many others, to secure a suitable site for the new Hall of Records, caused them to move a few blocks further up-town to a fine and comparatively new building, 149-153 Leonard street, near Centre, where they are now located, and to this building they have added 92-98 Centre street, adjoining their Leonard street building.

The immense works at New Haven, Conn., were established in 1863, moving there from New Britain, Conn., where for some time goods were manufactured in the building formerly used by Peck & Walter Company, of which company Sargent & Co. were an outgrowth, the removal being necessary in order to get more room than was available in New Britain, and thus this notable manufacturing city lost a house which has since taken its place as one of the largest manufacturing concerns in the country and in the world.

Mr. Sargent is endowed by nature with a robust physique and an impressive and dignified bearing, rendering him a conspicuous figure in any assembly. He has a vigorous intellect, which has been developed by education, earnest application to business and association with men of culture and of affairs. His opinions on questions relating to commercial matters are regarded as especially sound, resulting from his foresight, balanced and discriminating judgment, and the broad and comprehensive views taken of the subject under consideration. With exceptional financial ability and fidelity to any responsibilities assumed, he has an enviable reputation for sterling honesty and integrity. The fact that he is a good judge of character is also referred to as one of the characteristics which have contributed not a little to the pronounced success of his business career.

While in recent years he has ceased to give as much attention as formerly to details, he is attentive to business, keeping an observant eye on what is going on in the store, is very democratic in manner and can be approached without formality. He has a bluff, breezy way but withal a kind, genial manner that wins respect and makes friends.

Besides being a member of the Hardware Club he has long belonged to the Union League Club and the University Club, is a director of the Mercantile National Bank and is a member of the Chamber of Commerce, indicating the prominent place he occupies among the business men of New York City. Quite recently Mr. Sargent has been elected president of the Board of Trustees of the Leicester Academy of Leicester, Mass., at which institution he himself was prepared for college.

Michael F. Campbell, who held the contract of the drop forging, sheet metal press work and automatic wire machine department of Sargent & Co., of New Haven, Conn., for the past twenty-three years, has resigned and severed his connections with that firm. He has offers of positions of a similar character under consideration at the present time.

At the annual meeting of the Hazard Coates & Bennett Company, Rochester, N. Y., F. W. Reidenbach was elected secretary to take the place of C. E. West, resigned. Mr. Reidenbach will continue to act as superintendent of the plant. The other officers elected were Ernest C. Hazard, President; John Bennett, Vice President, and George R. Coates, Treasurer.

Press despatches from London, England, state that on October 16, at St. Peter's Episcopal Church, Hampstead, London, the marriage took place of Miss Florence Ethel, daughter of Mr. and Mrs. George Meacham Swan, of London, and Mr. Arthur T. Hagstoz, of Delanco, N. J. The ceremony was performed by the Rev. J. A. Hockey, vicar of the church. Mr. Hagstoz is the secretary and treasurer of T. B. Hagstoz, Ltd., smelters, refiners, assayers and dealers in gold, silver, platinum and mercury, at 709 Sansom street, Philadelphia, Pa.

Ernst Kaiser, representing the large German manufacturers of metal goods, Basse & Salve, has established an office at 42 Broadway, New York, where he will receive orders for his firm's goods. Basse & Salve employ upwards of 5,000 men, and make a specialty of nickel products.

Geo. E. Long, treasurer of the Joseph Dixon Crucible Company, of Jersey City, N. J., spent two weeks in the latter part of October and the first of November on a visit to the Florida properties of the company.

On September 1 Edward T. Coe resigned as treasurer of the Coe Brass Manufacturing Company, of Torrington, Conn., after having been connected with the company for 40 years. No one has been elected to fill his place, and it is probable no one will be elected to the vacant office for the balance of the fiscal year.

F. J. Davis, superintendent of the Electric Smelting and Aluminum Company, of Lockport, N. Y., has been seriously ill with typhoid fever for several months. He has now recovered and will shortly be at his desk again.

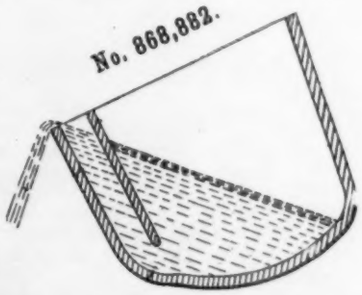
DEATHS

John W. Cox, identified with the Cox Brass Manufacturing Company, of Albany, N. Y., died September 27, at Round Lake, after an illness of two years. Mr. Cox was 34 years of age. He was born in Albany, the son of Mr. and Mrs. John Cox. In 1907 he married Miss Mary Kelly, daughter of the late William Kelly. He is survived by his wife and one son.

PATENTS

REVIEW OF CURRENT PATENTS OF INTEREST TO THE READERS OF THE METAL INDUSTRY.

868,882. October 22, 1907. MOLDER'S LADLE. George E. Neuberth, Newark, N. J. This ladle is so designed, as will be seen from the accompanying drawing, that it takes the molten metal from the bottom of the mass, but conducts and pours it from the top of the ladle. This is done to prevent the slag flowing into the mold, and all the metal but the slag can be used as the

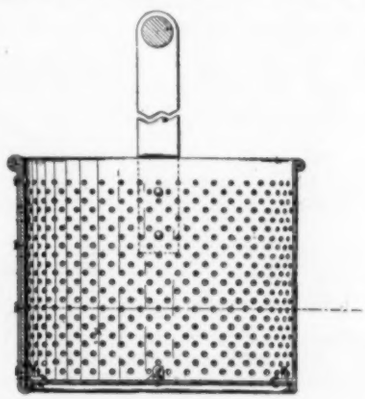


pouring can continue until the slag appears at the outlet, and then the pouring ceases. The ladle is provided, next to the pouring lip, with a partition extending from the top of the ladle down to nearly the bottom, thereby dividing the interior into two compartments. As the ladle is tipped in the act of pouring, only that metal below the bottom of the partition is permitted to escape, and as the pouring continues the slag settles, since all the metal is removed from beneath it.

869,140. October 22, 1907. SELF-HEATING SOLDERING IRON. Willis Mitchell, Malden, Mass. In this soldering iron the handle is used as a reservoir for the liquid fuel. It has a supplemental reservoir within it and near the tool point and nozzle of the burner is a generator consisting of annular retorts connected by

short passages. The generator is supplied by the inner reservoir through a pipe in a relatively slender intermediate tubular shank. The generated gas or vapor is supplied to the jet block which discharges into the mixing chamber which is surrounded by the generator. From the mixing chamber the ignited gas is directed into and upon the tool point. The needle valve is operated from the nearer end of the handle, thereby removing the packing of the valve beyond all action of the heat. This invention is an improved and simplified form of a patent granted to the same inventor about two years ago.

866,087. September 17, 1907. BASKET OR PAIL FOR ACID DIPPING. Adolf Temper, Brooklyn, N. Y., assignor to the Hanson & Van Winkle Company, of Newark, N. J. This basket overcomes the objections against the aluminum basket made of wire. The latter



lacks strength and will not stand up under the ordinary rough handling of every day work. The new form of basket, while so light as to be easily handled, at the same time has sufficient strength to permit of rough usage. It is made of sheet aluminum freely perforated through the sides and bottom. The sheet aluminum is formed into a cylinder and has the top and bottom edges turned over to add to the strength. The bottom is a separate plate and is fastened to the side with corner pieces and rivets. The handle is made of heavy strips and across the top is a round wooden bar by which the basket is handled. The drawing clearly shows the construction.

863,238. October 15, 1907. TAMPING BAR. Ernest W. Wheeler, Bay City, Mich. In the foot is attached a tube or pipe, at the bottom of which is a cushion of rubber or similar material. Sliding in the pipe is a bar carrying a weight at its outer end. The operator grasps the pipe with his left hand and guides the foot along the side of the mold without raising it out of the mold, while with his right hand he operates the weighted rod and does the striking. Either end of the device may be placed in the sand. There is no jar communicated to the arm or hand of the operator, and the end of the rod is not battered or damaged.

TRADE NEWS

TRADE NEWS OF INTEREST DESIRED FROM ALL OF OUR READERS. ADDRESS THE METAL INDUSTRY, 61 BEEKMAN STREET, NEW YORK.

The Waterbury Brass Company's new building near the railroad tracks, Waterbury, Conn., is nearing completoin.

The Pittsburg White Metal Company have removed from 1739 Liberty avenue, Pittsburg, Pa., to 3116 Penn avenue, of that city.

The Franklin Brass Foundry, formerly of 114 West street, Brooklyn, N. Y., have moved to Young street and Starr avenue, Long Island City, N. Y.

The Wm. Kane Manufacturing Company, formerly located at 1740 Market street, Philadelphia, Pa., have removed to 1909 Adams street, of that city.

R. Wallace & Sons' Manufacturing Company, manufacturers of flat ware, at Wallingford, Conn., report that their production this year will be way ahead of 1906.

The Muzzy-Lyon Company, manufacturers of babbitt metals, formerly at 56 Woodward avenue, Detroit, Mich., have moved recently to 149 Larned street, West.

The Seymour Manufacturing Company, Seymour, Conn., have recently received a number of large orders for German silver blanks from some Philadelphia manufacturers.

The Warner Company, chandelier manufacturers formerly located at 641 Arch street, Philadelphia, Pa., have moved to new quarters at 229 North Sixth street, of that city.

The French Manufacturing Company, of Waterbury, Conn., are now drawing brass tubing down to the smallness of 40/100 of an inch. They are planning to draw smaller sizes.

The firm of Rahn & Germann, 1603 State street, Erie, Pa., have been succeeded by the Germann Bronze Company and are now located at Nineteenth and Chestnut streets, of that city.

The Rowbottom Machine Company, of Waterbury, Conn., report that they have orders on hand to keep them busy for a year. They manufacture special automobile machinery.

Max Schweizer, 113 Kossuth street, Bridgeport, Conn., reports a steady and prosperous season, having just passed a summer which kept him busy filling orders with his process of etching metals.

The Niagara Falls Brass Manufacturing Company will erect a factory building in the Canadian city of Niagara Falls. A site, 150 by 188 feet, has been secured and work will be commenced immediately.

The Kato Manufacturing Company, of 236 Baldwin avenue, Jersey City, N. J., manufacturers of high grade artistic bronzes, have stopped all negotiations looking toward the removal of their plant to Bristol, Conn.

As evidence of how brass founders are beginning to buy copper, the brass works of McNabb & Harlin, Paterson, N. J., recently bought in one order fourteen carloads of copper at an average price of $7,000 per car.

F. H. Lovell & Company, of Arlington, N. J., manufacturers of marine lighting supplies, have been recently awarded the contract for the electric lighting equipment for the three new 20,000-ton battleships, amounting to about $40,000.

Work is progressing rapidly on the large new factory for the Norwich Nickel & Brass Company, Norwich, Conn. The building will be three stories high and will measure on the ground 50 by 180 feet. It will be constructed of brick.

The Syracuse Smelting Works have removed their office and works from Thirty-sixth street and Tenth avenue to the corner of Dobbins street and Nassau avenue, Brooklyn, N. Y., to which address all communications should be forwarded.

The brass foundry of Charles H. Birmingham & Co., of Baltimore, Md., will be moved to property purchased on the Washington road, at the junction of the Baltimore & Ohio and Pennsylvania roads. The tract contains about six acres.

The Cushman Chuck Company, of Hartford, Conn., are now working on orders that they received last April, and have faith that machinery manufacturers in general will not be affected materially by the financial disturbances of Wall Street.

The Manhattan Brass Company, 332 East 28th street, New York, have completed a new building on East 27th street, directly back of their present quarters. The addition is now occupied and in full operation for the manufacture of brass goods.

S. Huckins, 162 Clinton street, Toronto, Canada, is about to start in the jobbing business, making a specialty of britannia and German silver work. Mr. Huckins has had an extended experience and perfectly understands the buffing and polishing operations.

Reports have been widely circulated in the daily press that the Coe Brass Manufacturing Company, of Torrington, Conn., were about to start a new factory in Wisconsin. We are officially informed that the company has no intention of following such a course.

The brass foundries of San Francisco, Cal., are all busy filling orders. The jewelry shops are beginning to work overtime. Most of the job platers are still replating burned articles, mostly hardware, safe attachments, etc. The above is from our San Francisco correspondent.

Hard times have not struck the crucible industry, for the majority of the plants report a steady business. The Waterbury Crucible Company's work are running nights to keep up with their orders. They are now negotiating for land situated along the railroad to build a new plant.

A new enterprise for Nashville, Tenn., is the Tennessee Brass Foundry, which has opened up under the superintendency of Frank McKinstry. The foundry will manufacture brass, bronze and aluminum castings. The new concern starts out with every prospect of success and with the intention of producing only the best work.

William H. Bristol, 45 Vesey street, New York, manufacturer of pyrometers, reports such a demand for his recording and measuring instruments that he has difficulty filling orders. Mr. Bristol is completing his new factory in Jersey City, which will give him ample capacity for manufacture and testing, and expects to move about December 1st.

The addition to the Baird Machine Company's plant at Oakville, Conn., is half finished and will increase the floor space of the company one-third, or 10,000 additional square feet, giving them 25,000 square feet of floor space in all. The company manufacture tumbling barrels, foot and power presses and special wire forming and pointing machinery.

The Peck Drop Press Works, of New Haven, Conn., report that business is keeping up steadily, the slight lull giving them

a chance to catch up with their orders. Enough new business is coming in to keep them busy. The company are issuing a loose leaf catalog containing a number of fine illustrations of their machines and reading matter which will interest machinery users.

The Rolling Mills which have been running without shortening hours during the copper depression are the Piling Brass Company and the Waterbury Rolling Mills, of Waterbury, Conn. The Piling Company has been running the same as ever, rolling brass of special sizes, and the Waterbury Mills have been running full time since they started last spring. They are now rolling German silver and jewelers' base metals.

The New Era Lustre Company, of New Haven, Conn., are getting out a new lacquer. The new addition to their well known makes is one in which neither benzole nor benzine appears as an ingredient; it is therefore less volatile and does not require thinners. This firm have recently moved their offices to more commodious quarters in their factory building, 90 Water street, where they occupy the second floor.

The Sterling Smelting Company, 50 Greenpoint avenue, Brooklyn, N. Y., announce that besides carrying on a business as dealers in all kinds of metals, they are making a specialty in ingot metals, producing yellow and red brass ingots, bronze ingot and phosphor mixtures. This firm says that they furnished all the ingot metal for the art castings illustrated in the October issue of THE METAL INDUSTRY, and produced by Mr. J. G. Niederer.

Chas. T. Burlin, Whitinsville, Mass., has sold his separator business to the J. W. Paxson Company, of Philadelphia. Pa. Mr. Burlin has carried a 1-16 page card in THE METAL INDUSTRY for the past two years, and reports that he had more inquiries from this small sized card than from all the rest of the papers combined in which he was advertising. This is evidence of how THE METAL INDUUSTRY reaches the brass and kindred trades.

The Eureka Pneumatic Spray Company, of 92 Lafayette street, New York City, have sent the first consignment of sprayers for the Panama Canal, to be used in painting cars, bridges, iron and steel work. One point that particularly pleased the inspector was that these machines are constructed of brass, and would therefore eliminate the rust question, which is a serious drawback to anything taken to the Canal. The machines are of 1 and 2 gallon capacity.

Jno. H. Cowles & Company, of Louisville, Ky., have succeeded to the business of Haight & Company, manufacturers of brass castings and silver, nickel and copper plating and polishing and lacquering. The old firm had been conducting the business since 1875 and had an enviable reputation for doing first-class work. The new firm, which is composed of John H. Cowles and Edw. H. Stevens, will continue to do the same high grade work as did the old firm.

The smelting and refining firm of Baker & Freeman, Eddy street, Providence, R. I., has been changed to Baker & Windsor, E. C. Baker having bought the interest of Thomas J. Freeman. Mr. Baker has had ten years' experience in the smelting and refining of precious metals, and M. F. Windsor was formerly the traveling representative of Horace Remington & Sons Company, of Attleboro, Mass. The business of Baker & Windsor has about doubled during the past year.

"Spot Cash Buyers" is the constant slogan of the John C. Culbert Company, of Pawtucket, R. I., and now they announce that they are in the market for 500,000 pounds of red metal grindings, 500,000 pounds of yellow metal grindings, 500,000 pounds of copper scale, 500,000 pounds of heavy copper wire, 500,000 pounds of brass washings and 500,000 pounds of composition turnings. The company will be glad to communicate with any party or parties that has this material for sale.

The Hazard Coates & Bennet Company have bought six acres of ground at West Seneca, N. Y. (near Buffalo, N. Y.), where they will have an extensive iron yard. The plant will have a mile of railroad tracks, be equipped with electric cranes and machinery for handling iron in quantities. At Rochester, N. Y., the company have a large iron yard, and a model metal smelting plant, which has been described in THE METAL INDUSTRY. They sold recently 500,000 pounds of metal in one day.

Another new rolling mill is projected in Buffalo, N. Y. The Buffalo Tube Company, which has been incorporated for the manufacture of brass and copper tubing. The company has bought a building site 100x120 feet on Rano street, bordering on the Delaware, Lackawana and Western Railroad, near the copper smelting plant at Black Rock. The tube mill is not connected with the Buffalo Copper and Brass Rolling Mills now building, though it is located but a short distance from this plant.

The J. W. Paxson Company, of Philadelphia, Pa., have bought the rights, title and good will of the magnetic separator business of Chas. T. Burlin, of Whitinsville, Mass., a manufacturer and seller of the Ezra Sawyer separator. This separator has been remodeled and improved, and is one of the most popular on the market. Other standard products of the J. W. Paxson Company are melting furnaces, including forced and natural draft. The company makes a specialty of foundry supplies for brass founders.

It is doubtful if there is any concern making pure lead castings; but there are a great many manufacturers producing castings made from the Star Casting Metal, which is an alloy composed principally of lead, antimony and tin, and which is placed upon the market by the Hoyt Metal Company, of St. Louis, Mo. Of this metal there are probably 2,000 tons used a year in making small statues, picture frames, clocks and fern dishes. These are cast in brass molds and either goldplated, silverplated, or copperplated.

The J. D. Smith Foundry Supply Company are now in their new plant located at the corner of Scranton and Carter Roads, N. W. Cleveland, Ohio, and which was bought from the Variety Iron and Steel Works Company, known as their No. 1 plant. Their new shops give the Smith Company an additional floor space of about 62,000 square feet, which they are using as a machine shop to take care of their engineering and foundry equipment departments. The plant adjoins their facing mill, and the company now have their works and office together.

The Canton Brass Company, of Canton, O., have completed extensive additions to their plant, which practically triples their capacity for the manufacture of brass castings and specialties. The new foundry building is of brick, 50 by 160 feet; the coke and metal building, 40 by 60 feet, and the pattern storage building, 18 by 26 feet. The company also have in view the building of a duplicate of their foundry building to be used as an extension to the machine shop. The company have been in business only 6 months and yet have secured a very large amount of work.

The Detroit Polishers' and Platers' Supply Company, 213 E. Atwater street, Detroit, Mich., announce that they have several specialties for platers and polishers. Among them are the "Polisher's Friend," for oiling wheels to produce a high lustre on nickel and steel, to take the place of tallow. Something new is their line of linen wheels, to take the place of those made of bull neck. They also handle tripoli, 3Z White Diamond for coloring brass goods, canvas wheels, etc. They claim that their tripoli is a finer and faster cutter than the usual kind, and does not burn the work, and also that it improves with age.

The new machine shop of the Hanson & Van Winkle Company, Newark, N. J., is nearing completion and will be ready for equipment in February. It will be used for the manufacture of dynamos and polishing machinery, and occupies a space of 150x300. Opposite this machine shop the company now owns two entire city blocks, 300x350, which are occupied by their various factory buildings. The Hanson & Van Winkle Company report that since they put their mechanical electroplating apparatus on the market they have sold 500 of these machines.

The Dow Chemical Manufacturing Company are now located in their new Eastern office at 34 Court street, Bridgeport, Conn., where they have two entire floors and the basement, giving them much larger and better quarters than in their old building. Among the recent sales reported by Manager Wallace are: The equipment of the plating room of the Arrow Electric Company, Hartford, Conn.; the Acetylene Lamp Company, of Bridgeport, Conn. Part of the equipment of these concerns included a 700 ampere dynamo. The company are at present installing a 500 ampere dynamo for the Bryant Electric Company, of Bridgeport.

A new addition is being erected by the Menefee Foundry Company, of Fort Wayne, Ind. The new building, which is made of concrete blocks, will be modern throughout, containing trolley track systems for the handling of material on each floor. The shop will be equipped with Tabor molding machines of the 10 and 13 inch size. The compressed air for running these machines will be supplied by a new Curtis compressor directly connected to a motor of the Fort Wayne Electric Works manufacture. The blower is of the latest type of the Piqua Blower Company. The brass foundry will be equipped with Steele-Harvey crucible brass melting furnace using fuel oil. The core shop has been greatly enlarged, as has also the cleaning room.

A. E. Hobson, Meriden, Conn., inventor of the Hobson Manganese Bearing Metal, reports that tests are now being made of his alloy by some trolley roads and satisfactory results have been reported. In the shops of the Barbour Silver Company, at Meriden, there is a polishing lathe running with Hobson bearings which has not been oiled since the 17th day of December, 1906. The shaft is running 3,500 revolutions per minute. From present appearances it will run forever without requiring another drop of oil. Two tons of the Hobson Bearing Metal have been sold in various parts of the country. Other Hobson products are manganese zinc, used as a deoxidizer for brass and German silver. This product contains 15 per cent. of manganese and 85 of zinc, and 5 to 10 per cent. of it is used in alloying metals.

The Kenworthy Engineering Company, of Waterbury, Conn., now have on hand a lot of furnace work for various manufacturing concerns throughout the country, and are just now engaged in completing contracts for tinning, drying and dross furnaces, also a patented nail galvanizing machine for the Wilcox, Crittenden Company, of Middletown, Conn.

FIRES

The reports of the fire which recently occurred at the works of the Michigan Stove Company, Detroit, Mich., were very much overdrawn. The fire started in a shed in which the company were operating a temporary aluminizing oven. The loss was confined chiefly to the burning of the shed and to the rusting of a large lot of castings which were wet down by the fire department. The fire was at no time dangerous and the main plant was never in danger.

FINANCIAL

The Turner Brass Works have increased their capital from $150,000 to $168,000.

A voluntary petition in bankruptcy has been filed by Walter S. Butler, doing business under the firm name of the Butler Manufacturing & Plating Company, 737 Atlantic avenue, Boston, Mass.

The Washington Tin Plate Company, of Pittsburg, Pa., which was granted a charter recently, has filed notice of the issue of bonds for $160,000 and an increase of stock from $10,000 to $300,000.

The Bannatyne Watch Company, of Waterbury, Conn., has filed papers increasing its capital from $45,000 to $100,000. The officers of the company are Franklin Farrel, Jr., of Ansonia, president; George C. Bryant, of Ansonia, treasurer, and Archibald Bannatyne, secretary. The increase of capital is solely for the purpose of enlarging the facilities of the company. Mr. Bannatyne is the leading factor in the corporation and is well known for the improvements he has made in watch mechanisms.

At the meeting of the board of directors of the Bay State Brass Company, held at the office of the company, Haydenville, Mass., October 16, Cuyler K. Sanborn was unanimously elected president. Mr. Sanborn was formerly vice-president of the Haydenville company and until recently vice-president of the Plumbers' Trade Journal Publishing Company. The capital stock of the company has been increased from $30,000 to $100,000. Plans will be drawn immediately for the enlargement of the plant. The company have opened a New York office at 150 Nassau street.

INCORPORATIONS

The Aluminum Casting Company, of Chicago, Ill., has been incorporated with a capital of $25,000 by Benjamin Samuel, Morris Kompel and Himan R. Glick.

The Meshing Brass Foundry Company, of Milwaukee, Wis., has been incorporated with a capital of $6,000 by Edward Meshing, Lizzie Meshing and Barbara Schmidt.

The Spencer Machinery & Tool Company, of Spencer, Ind., has been incorporated with a capital of $10,000. The directors are J. B. Runner, J. M. Hawkins and William Fender.

The Fiat Automobile Company, of New York City, has been incorporated to manufacture automobiles, motors, etc., by Henry M. Wise and William F. Ashley, Jr., both of 40 Exchange place, and Robert W. Ashley, 141 Broadway, all New York City.

The Bunting Bronze & Brass Company, of Alliance, O., has been incorporated with a capital of $50,000 by W. H. Morgan, William Bunting, W. H. Bunting, W. H. Ramsey and E. N. Huggins.

The Diamond Brass Company, of New York City, has been incorporated with a capital of $1,000 by Gustave H. Loeb, 508 Amsterdam avenue; I. N. Gilbert, 31 Broadway, and Ben Lauterstein, of Northumberland, Pa.

The H. C. Medcroft Automobile Company, of Springfield, Mass., has been incorporated for the manufacture of automobiles with a capital of $35,000. Daniel E. Leary is the president and clerk and Harry C. Medcroft the treasurer.

The Screw Machine Specialty Company, of 100 Washington street, Chicago, Ill., has been incorporated with a capital of $2,500 to manufacture metallic specialties, tools and machinery, by Albert Christiansen, James J. Leahy and K. Neale.

The Knickerbocker Clock & Gear Company, of New York City, has been incorporated with a capital of $100,000, for the manufacture of clocks, etc. The directors are George S. Bull, 27 Manhattan avenue, and John J. Carr, 220 Broadway.

The Essex Brass Foundry Company, of Amesbury, Mass., has been incorporated with a capital of $10,000. The directors are: John Miller, president; Charles W. Putnam, treasurer. The new company will do a general foundry and machine business.

The New Era Lustre Company, New Haven, Conn., manufacturers of lacquers and bronzing liquids was incorporated on September 25th with a paid up capital of $100,000. Louis G. Miner, president, and Franklin S. Cobb, secretary and treasurer.

THE LENOX WATCH CASE COMPANY, of Brooklyn, N. Y., has been incorporated with a capital of $40,000 for the manufacture of watch cases. The directors are Abraham Belanowsky, 1395 Eastern Parkway, Brooklyn; Albert M. Waldman, 53 West 116th street, New York City, and Shae Geltman, 90 Osborn street, Brooklyn.

THE WILES-SMURR MANUFACTURING COMPANY, of Los Angeles, Cal., has been formed for the purpose of manufacturing brass merchandise. The capital stock is $100,000, all of which has been subscribed. The directors are: J. R. Smurr, W. W. Wiles and J. D. McCauley.

THE EMPIRE CITY METALLIC BED COMPANY, of New York City, has been incorporated with a capital of $50,000 for the manufacture of metallic beds, etc. The directors are Morris S. Segal, Samuel I. Segal, 184 Lewis street, Michael Gottlieb, James B. Gottlieb, 2 East 97th street.

THE BERKSHIRE ELECTRIC COMPANY, of Pittsfield, Mass., has been incorporated with a capital of $10,000 for the manufacture of electrical and mechanical apparatus. The president is Clarence H. Hopkins; treasurer, Arthur E. Truesdell, and clerk, George E. French, all of Pittsfield.

ARTHUR HOWARD, of London, has been incorporated to manufacture and deal in watches, diamonds, jewelry, etc., with a capital of $200,000. The directors are: Arthur Howard, 45 West 50th street; William J. Jeffrey, 27 Pine street; and Albert Slade, 27 Pine street, all New York City.

MECHANICAL UTILITIES COMPANY, of New York, has been incorporated with a capital of $50,000 for the manufacture of mechanical and electrical specialties. The directors are: Bernard G. Heyn, 60 Wall street; Moses G. Hubbard, Chatham, N. Y., and Edward J. Pierce, 60 Wall street, New York City.

THE AREQUIPA MACHINE COMPANY, of New York City, has been incorporated with a capital of $15,000 to manufacture brass and iron castings. The directors are Thomas F. Wright, 157 West 124th street; John B. Curry, 138 Liberty street, New York City, and Josiah M. Johnston, 389 Forest street, Jersey City.

THE AUTOMATIC CASH SALES MACHINE COMPANY, of New York City, has been incorporated with a capital of $150,000 by Joseph M. Williams, 25 Broad street; George P. Northrop, 116 Nassau street, and Edwin Benson, 507 Green avenue, Brooklyn, N. Y. The company will manufacture coin controlling machines, etc.

THE RIVERSIDE AUTO SUPPLY COMPANY, of New York City, has been incorporated with a capital of $30,000 to manufacture motors, engines, etc. The directors are William H. Atkinson, 728 Classon avenue, Brooklyn, N. Y.; H. C. Beebe, 163 West Eightieth street, New York City, and John A. Green, 563 Seventy-second street, Brooklyn.

PRINTED MATTER

ANTI-FRICTION METALS. The Pittsburg White Metal Company, of Pittsburg, Pa., are sending out blotters mentioning their babitt and anti-friction metals. Their armature anti-friction metal is especially adapted for high speed and heavy engines and armature bearings.

EMERGENCY ACCIDENT CABINET, made of selected oak, is being placed on the market by the Accident Cabinet Company, of Kalamazoo, Mich. This contains in convenient arrangement so as to be easily and quickly reached all the remedies that may be required in case of accident.

HOISTS AND TROLLEY TRACKS. "Giant Talks" for November, issued by the Coburn Trolley Track Manufacturing Company, of Holyoke, Mass., is an interesting pamphlet containing much that will prove of value to those having use for trolley tracks and hoists for handling material of all kinds. It would be well to send for one of these talks.

BRUSHES.—Hermann Blumenthal, of 184 William street, New York City, manufacturer of all kinds of brushes, constantly has on hand an assortment of machine and circular brushes, and brushes for chandelier manufacturers, silver and nickel platers. Mr. Blumenthal also manufactures brass, copper and steel wire brushes, and makes a specialty of repairs.

CORE ROOM.—A special edition of the Bulletin issued by the Obermayer Company, of Cincinnati, O., is devoted exclusively to the core room. It contains a number of well written articles on core work, besides showing a number of modern appliances for getting the largest amount of work with the smallest outlay. Copies are sent free to any one writing to the company.

STEELE-HARVEY CRUCIBLES. We have received from the Waterbury Crucible Company, of Waterbury, Conn., a catalogue of their crucibles made expressly for the Steele-Harvey furnaces. They are made of the best grades of Ceylon plumbago and German clay by skilled workmen and inspected at every stage from the time they are molded until they leave the factory. These crucibles are thoroughly seasoned before being finally burnt and they are not burnt until they have stood at least six weeks on the steam racks.

ALTERNATING CURRENT MOTOR LATHE. The 1908 variable speed alternating current polishing and buffing motor lathe, built by the W. Green Electric Company, 81 Nassau street, New York City, has 10 or more speeds, as desired, and is regulated exactly on the same principle as their direct current, without either belts, pulleys or friction shafts. They are made in powers from 1-6 to 1 horse, and the speeds range from 700 to 3,500 revolutions per minute. This tool is particularly intended for silversmiths, platers, case makers, ewelers, etc.

BASKET ANODES.—A pamphlet by the American Nickeloid & Manufacturing Company, of Peru, Ill., deals with their basket anodes which may be used to deposit metal of any kind, and in any form, such as brass or copper turnings, old anodes, grain nickel, etc. The metal to be deposited is held against a slab by means of a burlap bag which encircles the slab and metal and is laced at the back. The anodes are provided with a straight strip of copper which can be easily bent to form a hook, if this is desired. It is stated that these anodes can be used to great advantage for depositing brass or copper by plating machines.

ELECTRIC CLEANING COMPOUND.—The Imperial Chemical Company, Inc., of 1838 Central avenue, Cleveland, O., have prepared a very handsome pamphlet dealing with the merits of the electric cleaning compound, which is used with the electric current. This compound, used in the way directed, perfectly cleans the oil and grease from polished and buffed castings before plating in about 60 seconds. In addition it has the very important property of cleaning thoroughly without tarnishing the polished surface. Since the cleaning tank only requires about 1½ volts for its operation, any plating dynamo with a current force of 2 volts or more will operate it in addition to the regular plating vats.

RISDON SUB-PRESSES.—A circular from the Risdon Tool Works, Inc., of 63 Canal street, Waterbury, Conn., describes their new sub-presses which are particularly adapted for accurate work and for the duplication of parts. Whenever the amount of work required will warrant the outlay, the use of the compound die is recommended. This style of die will often cost double the price of an open die, but it will wear much longer There is no danger of shearing the punches when setting, and the dies are always in line. The fact that the pieces are blanked at the same instant the holes are pierced insures perfect accuracy throughout, and a large number of pieces can be blanked that are exactly alike and interchangeable.

"ALUMUNITE." This is the name given to a new solder which is guaranteed to solder aluminum to aluminum or aluminum to other metals. It is manufactured by the Aluminum Solder & Refining Company, of Oswego, N. Y. In this solder the difficulty arising from the oxide is overcome by a certain combination of acids; this combination does not destroy the oxide, but prevents it from forming after the surface has been scraped, heated and while the solder is being applied. The solder must be rubbed well into the aluminum, as it is impossible for the oxide to form if

the aluminum is well "tinned" with the solder. The solder should be sufficiently heated to run well and have the appearance of quicksilver. The best results are obtained with an ordinary gasoline torch to supply the heat and a small soldering copper.

ELLIPTIC NICKEL ANODES.—We have received from the Hanson & Van Winkle Company, of Newark, N. J., a pamphlet mentioning the advantages of their patented elliptic anodes. These are 2½ inches wide by 1½ inches thick, and are fitted with the usual suspension hooks. With the use of the ordinary flat anode the piece being plated receives a greater deposit on the edges than at the center. This serious objection is entirely overcome in the form of the elliptic anode. With the elliptic form of anode the deposit is uniform, as disintegration takes place from all sides of the anode, and consequently the molecules are distributed uniformly throughout the solution. This not only hastens the deposit, but gives a heavier deposit in a given time. Another important feature in these anodes is that they wear down evenly to a small, narrow strip, and when worn down to such a point that it seems desirable to put in more nickel, the old ones, which take up practically no room in the tank, can remain until entirely consumed, and as a result there is practically no scrap nickel to dispose of. The waste averages but 5 per cent of the original weight, while with a flat anode the waste is over 15 per cent.

ANALYZING AND TESTING BUREAU

THE METAL INDUSTRY is independent of all laboratories, but we offer our services in directing our readers where they can get metals, materials and supplies analyzed and tested to the best advantage. We have an intimate knowledge of the best laboratories in the country and know the specialties of the different ones. Cost for analysis or test furnished on receipt of sample.

INFORMATION BUREAU

Subscribers intending to purchase metals, machinery and supplies and desiring the names of the various' manufacturers and sellers of these products can obtain the desired information by writing to THE METAL INDUSTRY. Our Information Bureau is for the purpose of answering questions of all kinds. Send for circular, 61 Beekman street, New York City.

METAL MARKET REVIEW

NEW YORK, November 8, 1907.

COPPER.—Standard copper in London has fluctuated considerably following the declines and subsequent reaction in the New York market. Standard opened at £63 2s. 6d., declined to £55 10s., the low price of the year, and closed at £66, showing a net advance for the month of close to £3 per ton.

The New York copper market has made considerable history during the month of October.

It is especially interesting to note that, at a time when confidence in the financial stability of the country was pretty well shattered—New York seems to have had the worst scare—the copper market firmed up and prices rapidly advanced. It may be interesting to go over the entire month's development. On October 7 last we wrote in our copper market review that "The market to-day (Oct. 7) looks like 12½ cents, and unless demand improves considerably present prices cannot hold." At that time Lake and Electrolytic Copper were quoted at around 14½ cents per pound—prices gradually declined to around 11½ cents per pound by about the 22d of the month. During the entire month producers were selling freely abroad, and when bids from home consumers began to come in around the 15th and 20th of the month on the basis of irresponsible daily press prices and were turned down consumers here got badly scared, and enquiries from all over the country poured into the New York market and prices were rushed up from around 12 cents to 14½ and 14¾ cents, the London market started up at the same time and prices there advanced £11 per ton in a few days. The exports during the month will amount to close to 29,000 tons, and these are the largest exports on record, with the exception of January, 1904, when the total exports were 29,085 tons. Standard copper in London opened at £63, and our market was around 14½ cents. To-day standard spot copper is £67 (Nov. 1) and our market is around 14½ cents. The copper market is most assuredly in much better shape, and the large consumers have yet to come in as the late buying has been run all down by the small consumers all over the country. The market to-day closes rather easier at about ½ cent below the late advance, about 14½ cents for Lake and Electrolytic at from 14 to 14¼ for casting brands.

TIN.—The London tin market has had a bad break. Spot tin in London opened at £161 5s., dropped to £136 5s. (a decline of £25 per ton), and reached to £146 at the close, marking a net decline for the month of £15 per ton.

We have followed as usual the fluctuations of the London market. The arrivals for the month were 3,095 tons and the consumption is estimated at 2,800 tons. The statistical position of the metal is good and would presage higher prices, but the trade here are not feeling very bullish and no interest is shown by buyers, but of course if London bulls take hold and say "thumbs up" its up it will surely go. The market closes to-day at around 31 cents, against about 34 cents a month ago.

LEAD.—The London market has declined about £1 per ton during the month.

In the New York market the Trust have not made any change and the price stands at 4.75 for 50 ton lots. The outside market is about 10 points below this and lower prices are looked for.

SPELTER.—The London price has advanced about £1 per ton and closed at £22. The New York market has been more or less irregular at from 5.40 New York up to 5.62½, and closes at about 5½ New York.

ALUMINUM.—The market is easier on account of the let-up in demand, and prices are about 12 cents per pound below the high prices lately ruling. We quote the market to-day 38 to 40 cents according to quantity and time of delivery.

ANTIMONY.—The foreign market has been dull and prices have reacted slightly. In New York prices are inclined to give way, and consumers are buying very cautiously. We quote Cooksons around 11 cents, Halletts 10 cents, Hungarian grade at about 9 cents.

SILVER.—The London price of silver has been lower at around 27½d. in London, against 31d. a month ago, and New York 59¼ to-day, against 67½ last month.

SHEET METALS.—Sheet copper was reduced about one month ago to 20 cents base on a copper market price of 15 cents, and since that time there has been no change in sheet copper, and it is a question whether any change will be made now that copper is firmer again. In brass tubing, etc., there has been no change, but copper wire has been advanced from 13¾ cents base a month ago to 15 cents, and again to 16¾ cents base at the close.

OLD METALS.—The market has been very active and prices for all copper scrap have been better, and dealers have had a chance to sell a little scrap copper without losing much money. Composition metal is scarce and in good demand. Zinc dross has been dull and neglected at about 4¼ New York.

THE OCTOBER MOVEMENT IN METALS.

	Highest.	Lowest.	Average.
COPPER—			
Lake	15.25	12.56	14.12
Electrolytic	15.00	12.31	13.82½
Casting	14.75	12.12½	13.55½
TIN	37.62½	31.00	32.74
LEAD	4.77½	4.64	4.69
SPELTER	5.62½	5.40	5.52½
ANTIMONY (Halletts)	10.75	10.25	10.62

DAILY METAL PRICES

We have made arrangements with the New York Metal Exchange by which we can furnish our readers with the Official Daily Metal Market Reports of the Exchange and a year's subscription to THE METAL INDUSTRY for the sum of $10. The price of the Report alone is $10. Sample copies furnished for the asking. We can also furnish daily telegraphic reports of metal prices.

See Advertising Page 23 Following for Trade Wants

Metal Prices, November 11, 1907

NEW METALS.

	Price per lb.
COPPER, PIG, BAR AND INGOT AND OLD COPPER.	
Duty Free. Manufactured 2½c. per lb.	
Lake, car load lots	14.50
Electrolytic, car load lots	14.00
Casting, car load lots	13.75
TIN—Duty Free.	
Straits of Malacca, car load lots	30.50
LEAD—Duty Pigs, Bars and Old 2⅛c. per lb. pipe and sheets 2½c. per lb.	
Pig lead, car load lots	4.70
SPELTER—Duty 1½c. per lb.	
Western, car load lots	5.40
ALUMINUM—Duty Crude, 8c. per lb. Plates, sheets, bars and rods 13c. per lb.	
Small lots.....Nominal	43.00
100 lb. lots..... "	41.00
Ton lots ..... "	39.00
ANTIMONY—Duty ¾c. per lb.	
Cookson's, cask lots, nominal	11.00
Halletts, cask lots	10.25
Other, cask lots	10.00
NICKEL—Duty 6c. per lb.	
Shot, Plaquettes, Ingots, Blocks, according to quantity	.45 to .60
MANGANESE—Duty 20%	.80
MAGNESIUM—Duty Free	$1.45
BISMUTH—Duty Free	1.80
CADMIUM—Duty Free	1.55 to 1.60

	Price per oz.
GOLD—Duty Free	$20.67
SILVER—Duty Free	.58½
PLATINUM—Duty Free	27.00
QUICKSILVER—Duty 7c. per lb. Price per pound	.63c. to 64c.

OLD METALS.

	Price per lb.	
Heavy Cut Copper	12.50	13.00
Copper Wire	12.00	12.50
Light Copper	11.00	11.50
Heavy Mach. Comp.	11.00	11.50
Heavy Brass	8.50	9.00
Light Brass	6.00	7.00
No. 1 Yellow Brass Turnings	7.00	7.50
No. 1 Comp. Turnings	9.00	9.50
Heavy Lead	3.75	4.25
Zinc Scrap	4.00	4.25
Scrap Aluminum, sheet, pure	25.00	27.00
Scrap Aluminum, cast, alloyed	19.00	25.00
Scrap Aluminum, turnings	8.00	11.00
Old Nickel, solid	22.00	26.00
No. 1 Pewter	25.00	26.00

INGOT METALS.

	Price per lb.
SILICON COPPER, according to quantity	33 to 38
PHOSPHOR COPPER, 5%	19 to 21
Phosphor Tin	40 to 42
Brass Ingot, Yellow	10 to 12
Brass Ingot, Red	13 to 15
Bronze Ingot	12 to 14
Manganese Bronze	17 to 19
Phosphor Bronze	18 to 21

ZINC—Duty, sheet, 2c. per lb.	Price per lb.
600 lb. casks	7.50
Open casks	8.00

PHOSPHORUS—Duty 18c. per lb.	
According to quantity	35 to 45

PRICES OF SHEET COPPER.

SIZES OF SHEETS.		96oz. & over 75 lb. sheet 30x60 and heavier	64oz. to 96oz. 50 to 75 lb. sheet 30x60	32oz. to 64oz. 25 to 50 lb. sheet 30x60	24oz. to 32oz. 18¾ to 25 lb. sheet 30x60	16oz. to 24oz. 12½ to 18¾ lb. sheet 30x60	14oz. and 15oz. 11 to 12½ lb. sheet 30x60
		CENTS PER POUND.					
Not wider than 30 ins.	Not longer than 72 ins.	20	20	20	20	20	21
	Longer than 72 ins. Not longer than 96 ins.	20	20	20	20	20	21
	Longer than 96 ins.	20	20	20	20	20	22
Wider than 30 ins. but not wider than 36 ins.	Not longer than 72 ins.	20	20	20	20	20	22
	Longer than 72 ins. Not longer than 96 ins.	20	20	20	20	20	22
	Longer than 96 ins. Not longer than 120 ins.	20	20	20	20	21	23
	Longer than 120 ins.	20	20	20	21	22	
Wider than 36 ins. but not wider than 48 ins.	Not longer than 72 ins.	20	20	20	21	22	24
	Longer than 72 ins. Not longer than 96 ins.	20	20	20	21	23	25
	Longer than 96 ins. Not longer than 120 ins.	20	20	20	22	24	28
	Longer than 120 ins.	20	20	21	23	26	
Wider than 48 ins. but not wider than 60 ins.	Not longer than 72 ins.	20	20	20	21	23	26
	Longer than 72 ins. Not longer than 96 ins.	20	20	20	22	24	29
	Longer than 96 ins. Not longer than 120 ins.	20	20	21	23	26	
	Longer than 120 ins.	21	21	22	24	28	
Wider than 60 ins. but not wider than 72 ins.	Not longer than 96 ins.	20	20	21	23	28	
	Longer than 96 ins. Not longer than 120 ins.	20	20	22	25	30	
	Longer than 120 ins.	21	21	23	28		
Wider than 72 ins. but not wider than 108 ins.	Not longer than 96 ins.	21	21	23	26		
	Longer than 96 ins. Not longer than 120 ins.	22	22	24	27		
	Longer than 120 ins.	23	23	25	29		
Wider than 108 ins.	Not longer than 132 ins.	24	24	26			
	Longer than 132 ins.	25	25	28			

Rolled Round Copper, ⅜ inch diameter or over, 20 cents per pound. (Cold Drawn, Square and Special Shapes, extra.)

Circles, Segments and Pattern Sheets three (3) cents per pound advance over prices of Sheet Copper required to cut them from.

All Cold or Hard Rolled Copper, 14 ounces per square foot and heavier, one (1) cent per pound over the foregoing prices.

All Cold or Hard Rolled Copper, lighter than 14 ounces per square foot, two (2) cents per pound over the foregoing prices.

Cold Rolled and Annealed Copper, Sheets and Circles, take the same price as Cold or Hard Rolled Copper of corresponding dimensions and thickness.

All Polished Copper, 20 inches wide and under, one (1) cent per pound advance over the price for Cold Rolled Copper.

All Polished Copper, over 20 inches wide, two (2) cents per pound advance over the price for Cold Rolled Copper.

Planished Copper, one (1) cent per pound more than Polished Copper.

Cold Rolled Copper prepared suitable for polishing, same prices and extras as Polished Copper.

Tinning Sheets, on one side, 3½c. per square foot.

For tinning both sides, double the above price.

For tinning the edge of sheets, one or both sides, price shall be the same as for tinning all of one side of the specified sheet.

Metal Prices, November 11, 1907

Net Cash Prices.

COPPER BOTTOMS, PITS AND FLATS.

14 oz. to square foot and heavier, per lb.	24c.
12 oz. and up to 14 oz. to square foot, per lb.	25c.
10 oz. and up to 12 oz.	27c.
Lighter than 10 oz.	30c.

Circles less than 8 in. dia., 2c. per lb. additional.
Circles over 13 in. dia. are not classed as Copper Bottoms.
Polished Copper Bottoms and Flats, 1c. per lb. extra.

PRICES ON BRASS MATERIAL—MILL SHIPMENTS.

In effect September 30th, 1907, and until further notice.

To customers who purchase less than 5,000 lbs. per month and over 5,000 lbs. per year.

	Net base per lb. High Brass.	Low Brass.	Bronze.
Sheet	$0.15¼	$0.17⅝	$0.19½
Wire ¼" and larger	.15½	.17⅞	.19¾
Wire smaller than ¼" to No. 8, inclusive	.16¼	.18⅝	.20½
Wire smaller than No. 8 to No. 10, inclusive	.16⅝	.19¼	.21
Rods ¼" and larger to ½" diameter	.15⅝	.18¼	.21
Rods ½" to 1" diameter, both inclusive	.15½	.17⅞	.20¾
Brazed brass tubing	.21⅜	—	—
Brazed bronze and copper tubing	—	—	.24½
Open seam brass tubing	.19⅝	—	—
Open seam bronze tubing	—	—	.22½
Brass angle and channel	.21⅜	—	—
Bronze angle and channel	—	—	.25⅝

15 per cent. discount from all extras except for quality.

NET EXTRAS FOR QUALITY.

Sheet—Extra spring, drawing and spinning brass.....1¼c. per lb. net advance.
" —Best spring, drawing and spinning brass.....2¼c. " " " "
" —Rich low brass ..... ¾c. " " " "
Wire—Extra spring and brazing brass wire.....1¼c. " " " "
" —Best spring and brazing brass wire.....2¼c. " " " "
" —Rich low brass wire..... ¾c. " " " "

To customers who purchase less than 5,000 lbs. per year.

	Net base per lb. High Brass.	Low Brass.	Bronze.
Sheet	$0.16¼	$0.18⅝	$0.20½
Wire ¼" and larger	.16½	.18⅞	.20¾
Wire smaller than ¼" to No. 8, inclusive	.17¼	.19⅝	.21½
Wire smaller than No. 8 to No. 10, inclusive	.17⅝	.20¼	.22
Rods ¼" and larger to ½" diameter	.16⅝	.19¼	.22
Rods ½" to 1" diameter, both inclusive	.16½	.18⅞	.21¾
Brazed brass tubing	.22⅜	—	—
Brazed bronze and copper tubing	—	—	.25½
Open seam brass tubing	.20⅝	—	—
Open seam bronze tubing	—	—	.23½
Brass angle and channel	.22⅜	—	—
Bronze angle and channel	—	—	.26⅝

5 per cent discount from all extras except for quality.

NET EXTRAS FOR QUALITY.

Sheet—Extra spring, drawing and spinning brass.....2¼c. per lb. net advance.
" —Best spring, drawing and spinning brass.....3½c. " " " "
" —Rich low brass.....1⅝c. " " " "
Wire—Extra spring and brazing brass wire.....2¼c. " " " "
" —Best spring and brazing brass wire.....3½c. " " " "
" —Rich low brass.....1⅝c. " " " "

PRICES FOR SEAMLESS BRASS TUBING.

From 1¼ to 8½ in. O. D. Nos. 4 to 13 Stubs Gauge, 20c. per lb.
Seamless Copper Tubing, 23c. per lb.

For other sizes see Manufacturers' List.

PRICES FOR SEAMLESS BRASS TUBING Iron Pipe Sizes.

Iron Pipe Size.	⅛	¼	⅜	½	¾	1	1¼	1½	2	2½	3	3½	4	4½	5	6
Price per lb.	28	27	22	21	20	20	20	20	20	20	20	21	22	24	26	27

PRICE LIST OF IRON LINED TUBING—NOT POLISHED.

	Per 100 Feet. Brass.	Bronze.
⅝ inch	$8.00	$0.00
⅞ inch	8.00	9.00
⅝ inch	10.00	11.00
¾ inch	12.00	13.00
⅞ inch	14.00	15.00
1 inch	18.00	20.00
1¼ inch	22.00	24.00
1¾ inch	25.00	27.00
1½ inch	32.00	35.00
1¾ inch	45.00	48.00
2 inch	56.00	60.00

Discount 45 per cent.

PRICES FOR MUNTZ METAL AND TOBIN BRONZE.

Muntz or Yellow Metal Sheathing (14" x 48").....16c. lb. net base.
" " " Rectangular Sheets other than Sheathing .....18c. " " "
" " " Rod .....17c. " " "
Tobin Bronze Rod.....18c. " " "
Above are for 100 lbs. or more in one order.

PRICES FOR SHEET BLOCK TIN AND BRITANNIA METAL.

Not over 18 in. in width, not thinner than 23 B. S. Gauge, 4c. above price of pig tin in same quality.
Not over 35 in. in width, not thinner than 22 B. S. Gauge, 5c. above price of pig tin.

PRICE LIST FOR SHEET ALUMINUM—B. & S. Gauge.

Wider than ..... and including..	8in. 12in.	6in. 14in.	14in. 16in.	16in. 18in.	18in. 20in.	20in. 24in.	24in. 30in.	30in. 36in.	36in. 40in.
	in coils.								
No. 13 and heavier	47	47	49	49	49	49	52	52	52
" 14	47	47	49	49	49	49	52	52	52
" 15	47	47	49	49	49	49	52	52	52
" 16	47	47	49	49	49	49	52	52	52
" 17	47	47	49	49	49	49	52	52	52
" 18	47	47	49	49	49	49	52	52	55
" 19	47	47	49	49	49	49	52	53	56
" 20	47	49	49	49	49	51	54	55	57
" 21	47	51	51	51	51	53	56	57	63
" 22	47	51	51	51	53	53	56	60	64
" 23	47	51	51	51	53	53	56	62	65
" 24	47	51	53	55	55	55	58	64	67
" 25	49	52	54	56	56	56	59	66	70
" 26	49	52	55	59	59	59	64	68	74
" 27	49	53	57	61	61	62	67	71	77
" 28	49	53	59	61	62	62	69	75	80
" 29	51	54	61	63	65	65	74	80	85
" 30	51	55	63	65	69	75	82	85	90
" 31	56	60	68	71	76	84	87	90	96
" 32	58	62	70	74	82	90	97	103	108
" 33	60	64	73	78	86	97	104	113	123
" 34	63	68	75	83	91	104	116	123	135
" 35	..	78	83	93	103	113	128	138	..
" 36	..	93	103	113	128	133	148	..	..
" 37	..	117	121	142	157	172	187	..	..
" 38	..	137	152	167	182	197	217	..	..
" 39	..	157	177	197	217	237	..	..	..
" 40	..	187	217	237	257	..	..	..	..

Extras are now charged over list prices whatever that may be on the day of order. Extra charges for cutting to length and polishing and satin finishing.

In flat rolled sheets the above prices refer to lengths between 2 and 8 feet. Prices furnished by the manufacturers for wider and narrower sheet. All columns except the first refer to flat rolled sheet. Prices are for 50 lbs. or more at one time. Less quantities 5c. lb. extra. Charges made for boxing.

PRICE LIST OF SEAMLESS ALUMINUM TUBING—STUBS' GAUGE.

Stubs' G.	¼"	⅜"	½"	⅝"	¾"	1"	1½"	2"	2½"	2¾"
4 to 11	..	..	96	86	83	77	67	61	61	61
12	..	1.08	96	86	83	77	67	61	61	61
13	..	1.08	96	86	83	77	67	64	64	64
14	..	1.08	96	86	83	77	67	64	64	64
15	..	1.12	96	89	86	80	70	67	67	67
16	..	1.15	99	93	89	83	70	70	70	70
17	..	1.18	1.02	96	93	86	73	73	73	73
18	1.85	1.24	1.05	99	93	86	77	77	77	80
19	1.88	1.28	1.08	1.02	99	93	83	80	80	83
20	1.95	1.31	1.15	1.08	1.05	99	89	86	86	86
21	2.01	1.37	1.21	1.15	1.12	1.05	99	93	93	96
22	2.17	1.44	1.24	1.18	1.15	1.08	1.05	99	1.05	1.05
23	2.33	1.50	1.31	1.24	1.21	1.15	1.15	1.08	1.15	1.15
24	2.48	1.60	1.37	1.31	1.28	1.18	1.21	1.21	1.24	..
25	2.65	1.69	1.47	1.37	1.34	1.28	1.34	..	..	..

Prices are for lots of 50 lbs. Boxing extra. Smaller, larger and intermediate sizes furnished by manufacturers.

PRICE LIST FOR ALUMINUM ROD AND WIRE—B. & S. GAUGE.

Diameter B. & S. G'ge	000 to No. No. 10.	No. 11.	No. 12.	No. 13.	No. 14.	No. 15.	No. 16.	No. 17.	No. 18.	No. 19.	No. 20.	No. 21	No. 22.
Price, per lb.	43	43½	43½	44	44½	45	45½	46	47	48	49	52	57

200 lbs. to 30,000 lbs., 3 cents off list; 30,000 lbs. and over, 4 cents off list.

PRICE LIST FOR GERMAN SILVER IN SHEETS AND ROLLS.

Per cent.	Price per lb.	Per cent.	Price per lb.
12	$0.52	16	$0.58
13	.53	17	.59
14	.54	18	.60
15	.55		

These prices are for sheets and rolls over 2 inches in width, to and including 8 inches in width and to No. 20, inclusive, American or Brown & Sharpe's Gauge. Prices are for 100 lbs. or more of one size and gauge in one order. Discount 45 per cent.

GERMAN SILVER TUBING.

4 per cent.	to No.	19,	B. & S.	Gauge, inclusive	$0.60
6 "	"	19,	"	" "	.70
9 "	"	19,	"	" "	.85
12 "	"	19,	"	" "	1.00
15 "	"	19,	"	" "	1.15
16 "	"	19,	"	" "	1.20
18 "	"	19,	"	" "	1.30

German Silver Tubing thinner than No. 19 B. & S. Gauge add same advances as for Brazed Brass Tube.

For cutting to special lengths add same advances as for Brazed Brass Tube. Discount 35 per cent.

PRICE OF SHEET SILVER.

Roller sterling silver .925 fine is sold according to gauge quantity and market conditions. No fixed quotations can be given as prices range from 2c. below to 6c. above the price of bullion.

Rolled silver anodes .999 fine are quoted at 2c. above the price of bullion.

Metal Prices, November 11, 1907

Net Cash Prices.

COPPER BOTTOMS, PITS AND FLATS.

14 oz. to square foot and heavier, per lb	24c.
12 oz. and up to 14 oz. to square foot, per lb	25c.
10 oz. and up to 12 oz	27c.
Lighter than 10 oz	30c.

Circles less than 8 in. dia., 2c. per lb. additional.
Circles over 13 in. dia. are not classed as Copper Bottoms.
Polished Copper Bottoms and Flats, 1c. per lb. extra.

PRICES ON BRASS MATERIAL—MILL SHIPMENTS.

In effect September 30th, 1907, and until further notice.

To customers who purchase less than 5,000 lbs. per month and over 5,000 lbs. per year.

	Net base per lb. High Brass.	Low Brass.	Bronze.
Sheet	$0.15¼	$0.17⅝	$0.19½
Wire ⅛" and larger	.15½	.17⅞	.19¾
Wire smaller than ⅛" to No. 8, inclusive	.16¼	.18⅝	.20½
Wire smaller than No. 8 to No. 10, inclusive	.16⅝	.19⅛	.21
Rods ¼" and larger to ½" diameter	.15⅝	.18⅛	.21
Rods ½" to 1" diameter, both inclusive	.15½	.17⅞	.20¾
Brazed brass tubing	.21⅜	—	—
Brazed bronze and copper tubing	—	—	.24½
Open seam brass tubing	.19¾	—	—
Open seam bronze tubing	—	—	.22½
Brass angle and channel	.21¾	—	—
Bronze angle and channel	—	—	.25¾

15 per cent. discount from all extras except for quality.

NET EXTRAS FOR QUALITY.

Sheet—Extra spring, drawing and spinning brass	1¼c. per lb. net advance.
" —Best spring, drawing and spinning brass	2¼c. " " " "
" —Rich low brass	⅝c. " " " "
Wire—Extra spring and brazing brass wire	1¼c. " " " "
" —Best spring and brazing brass wire	2¼c. " " " "
" —Rich low brass wire	⅝c. " " " "

To customers who purchase less than 5,000 lbs. per year.

	Net base per lb. High Brass.	Low Brass.	Bronze.
Sheet	$0.16¼	$0.18⅝	$0.20½
Wire ⅛" and larger	.16½	.18⅞	.20¾
Wire smaller than ⅛" to No. 8, inclusive	.17¼	.19⅝	.21½
Wire smaller than No. 8 to No. 10, inclusive	.17⅝	.20⅛	.22
Rods ¼" and larger to ½" diameter	.16⅝	.19⅛	.22
Rods ½" to 1" diameter, both inclusive	.16½	.18⅞	.21¾
Brazed brass tubing	.22⅜	—	—
Brazed bronze and copper tubing	—	—	.25½
Open seam brass tubing	.20¾	—	—
Open seam bronze tubing	—	—	.23½
Brass angle and channel	.22¾	—	—
Bronze angle and channel	—	—	.26¾

5 per cent discount from all extras except for quality.

NET EXTRAS FOR QUALITY.

Sheet—Extra spring, drawing and spinning brass	2¼c. per lb. net advance.
" —Best spring, drawing and spinning brass	3¼c. " " " "
" —Rich low brass	1⅝c. " " " "
Wire—Extra spring and brazing brass wire	2¼c. " " " "
" —Best spring and brazing brass wire	3¼c. " " " "
" —Rich low brass	1⅝c. " " " "

PRICES FOR SEAMLESS BRASS TUBING.

From 1¼ to 3½ in. O. D. Nos. 4 to 13 Stubs Gauge, 20c. per lb.
Seamless Copper Tubing, 23c. per lb.

For other sizes see Manufacturers' List.

PRICES FOR SEAMLESS BRASS TUBING Iron Pipe Sizes.

Iron Pipe Size.	⅛	¼	⅜	½	¾	1	1¼	1½	2	2½	3	3½	4	4½	5	6
Price per lb.	28	27	22	21	20	20	20	20	20	20	20	21	22	24	26	27

PRICE LIST OF IRON LINED TUBING—NOT POLISHED.

	Per 100 Feet. Brass.	Bronze.
⅜ inch	$8.00	$9.00
½ inch	8.00	9.00
⅝ inch	10.00	11.00
¾ inch	12.00	13.00
⅞ inch	14.00	15.00
1 inch	18.00	20.00
1⅛ inch	22.00	24.00
1¼ inch	25.00	27.00
1½ inch	32.00	35.00
1¾ inch	45.00	48.00
2 inch	56.00	60.00

Discount 45 per cent.

PRICES FOR MUNTZ METAL AND TOBIN BRONZE.

Muntz or Yellow Metal Sheathing (14" x 48")	16c. lb. net base.
" " " Rectangular Sheets other than Sheathing	18c. " " "
" " " Rod	17c. " " "
Tobin Bronze Rod	18c. " " "

Above are for 100 lbs. or more in one order.

PRICES FOR SHEET BLOCK TIN AND BRITANNIA METAL.

Not over 18 in. in width, not thinner than 23 B. S. Gauge, 4c. above price of pig tin in same quality.
Not over 35 in. in width, not thinner than 22 B. S. Gauge, 5c. above price of pig tin.

PRICE LIST FOR SHEET ALUMINUM—B. & S. Gauge.

	Wider than ..... 3in. and including.. 12in.	6in. 14in.	14in. 16in.	16in. 18in.	18in. 20in.	20in. 24in.	24in. 30in.	30in. 36in.	36in. 40in.
	in coils.								
No. 13 and heavier	47	47	49	49	49	49	52	52	52
" 14	47	47	49	49	49	49	52	52	52
" 15	47	47	49	49	49	49	52	52	52
" 16	47	47	49	49	49	49	52	52	52
" 17	47	47	49	49	49	49	52	52	52
" 18	47	47	49	49	49	49	52	52	55
" 19	47	47	49	49	49	49	52	53	56
" 20	47	49	49	49	49	51	54	55	57
" 21	47	51	51	51	51	53	56	57	63
" 22	47	51	51	51	53	53	56	60	64
" 23	47	51	51	51	53	53	56	62	65
" 24	47	51	53	55	55	55	58	64	67
" 25	49	52	54	56	56	56	59	66	70
" 26	49	52	55	59	59	59	64	68	74
" 27	49	53	57	61	61	62	67	71	77
" 28	49	53	59	61	62	62	69	75	80
" 29	51	54	61	63	65	65	74	80	85
" 30	51	55	63	65	69	75	82	85	90
" 31	56	60	68	71	76	84	87	90	96
" 32	58	62	70	74	82	90	97	103	108
" 33	60	64	73	78	86	97	104	113	123
" 34	63	68	75	83	91	104	116	123	133
" 35	..	78	83	93	103	113	128	138	..
" 36	..	93	103	113	128	133	148	..	..
" 37	..	117	121	142	157	172	187	..	..
" 38	..	137	152	167	182	197	217	..	..
" 39	..	157	177	197	217	237	..	..	..
" 40	..	187	217	237	257	..	..	..	..

Extras are now charged over list prices whatever that may be on the day of order. Extra charges for cutting to length and polishing and satin finishing.

In flat rolled sheets the above prices refer to lengths between 2 and 8 feet. Prices furnished by the manufacturers for wider and narrower sheet. All columns except the first refer to flat rolled sheet. Prices are for 50 lbs. or more at one time. Less quantities 5c. lb. extra. Charges made for boxing.

PRICE LIST OF SEAMLESS ALUMINUM TUBING—STUBS' GAUGE.

Stubs' G.	⅛"	¼"	⅜"	½"	⅝"	¾"	1"	1½"	2"	2½"	2¾"
4 to 11	..	..	96	86	83	77	67	61	61	61	
12	..	1.08	96	86	83	77	67	61	61	61	
13	..	1.08	96	86	83	77	67	64	64	64	
14	..	1.08	96	86	83	77	67	64	64	64	
15	..	1.12	96	89	86	80	70	67	67	67	
16	..	1.15	99	93	89	83	70	70	70	70	
17	..	1.18	1.02	96	93	86	73	73	73	73	
18	1.85	1.24	1.05	99	93	86	77	77	77	80	
19	1.88	1.28	1.08	1.02	99	93	83	80	80	83	
20	1.95	1.31	1.15	1.08	1.05	99	89	86	86	86	
21	2.01	1.37	1.21	1.15	1.12	1.05	99	93	93	96	
22	2.17	1.44	1.24	1.18	1.15	1.08	1.05	99	1.05	1.05	
23	2.33	1.50	1.31	1.24	1.21	1.15	1.15	1.08	1.15	1.15	
24	2.48	1.60	1.37	1.31	1.28	1.18	1.21	1.21	1.24	..	
25	2.65	1.69	1.47	1.37	1.34	1.28	1.34	..	..	..	

Prices are for lots of 59 lbs. Boxing extra. Smaller, larger and intermediate sizes furnished by manufacturers.

PRICE LIST FOR ALUMINUM ROD AND WIRE—B. & S. GAUGE.

Diameter B. & S. G'ge	000 to No. 10.	No. 11.	No. 12.	No. 13.	No. 14.	No. 15.	No. 16.	No. 17.	No. 18.	No. 19.	No. 20.	No. 21	No. 22.
Price, per lb.	43	43½	43½	44	44½	45	45½	46	47	48	49	52	57

200 lbs. to 30,000 lbs., 3 cents off list; 30,000 lbs. and over, 4 cents off list.

PRICE LIST FOR GERMAN SILVER IN SHEETS AND ROLLS.

Per cent.	Price per lb.	Per cent.	Price per lb.
12	$0.52	16	$0.58
13	.53	17	.59
14	.54	18	.60
15	.55		

These prices are for sheets and rolls over 2 inches in width, to and including 8 inches in width and to No. 20, inclusive, American or Brown & Sharpe's Gauge. Prices are for 100 lbs. or more of one size and gauge in one order. Discount 45 per cent.

GERMAN SILVER TUBING.

4 per cent.	to No.	10, B. & S. Gauge, inclusive			$0.60
6 "	"	10,	"	"	.70
9 "	"	10,	"	"	.85
12 "	"	10,	"	"	1.00
15 "	"	10,	"	"	1.15
16 "	"	10,	"	"	1.20
18 "	"	10,	"	"	1.30

German Silver Tubing thinner than No. 19 B. & S. Gauge add same advances as for Brazed Brass Tube.
For cutting to special lengths add same advances as for Brazed Brass Tube. Discount 35 per cent.

PRICE OF SHEET SILVER.

Roller sterling silver .925 fine is sold according to gauge quantity and market conditions. No fixed quotations can be given as prices range from 2c. below to 6c. above the price of bullion.
Rolled silver anodes .900 fine are quoted at 2c. above the price of bullion.